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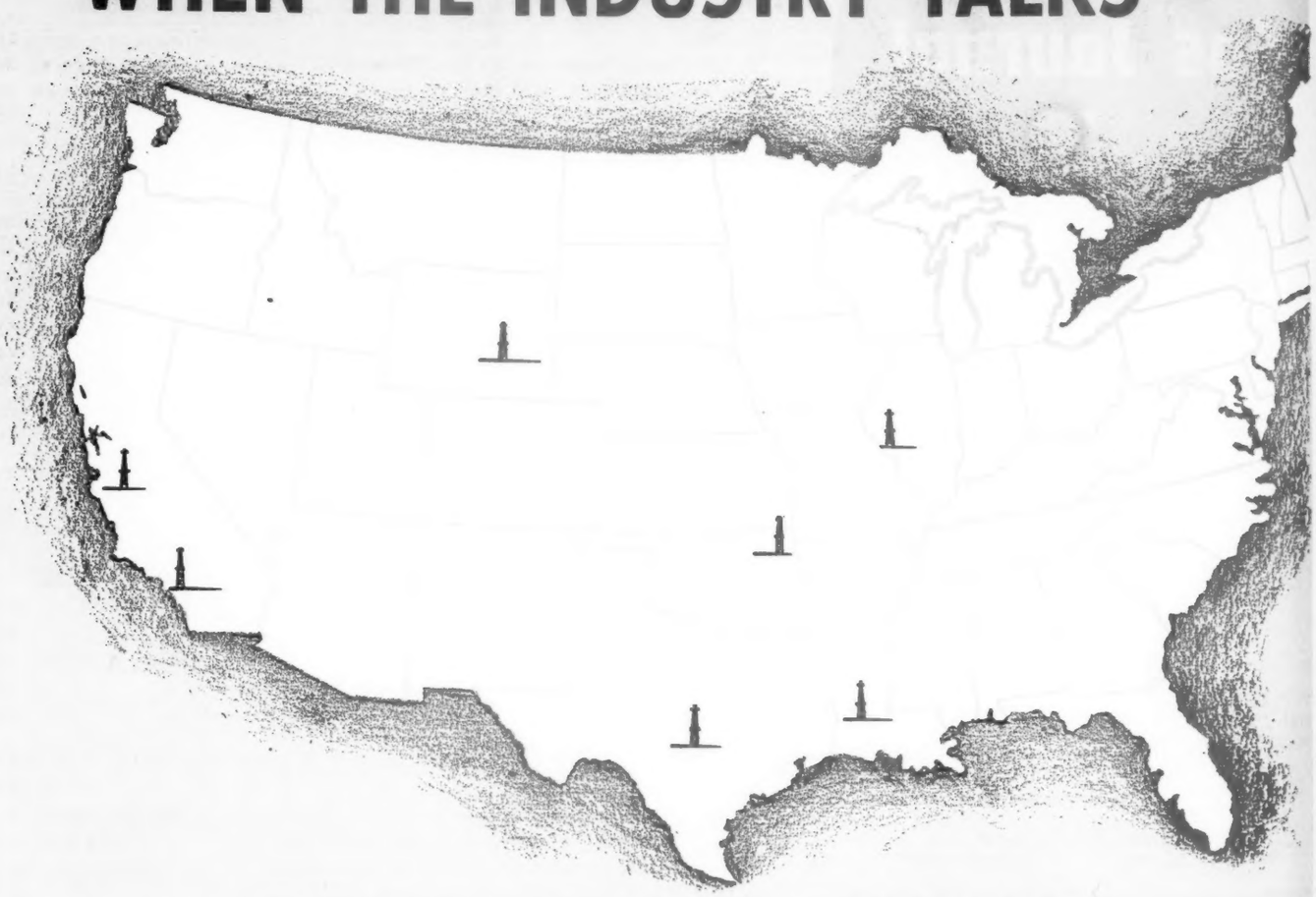
WHEN THE INDUSTRY TALKS—



IT PAYS TO LISTEN

LOS ANGELES BASIN

"... Squeezing cement through shot perforations to cement off water entry from above and below a producing horizon, is only one of the successful applications we have found for the Baker Cement Retainer here in the Basin."

SAN JOAQUIN VALLEY

"... So we used a Cement Retainer to do a multiple batch squeeze job around the shoe ... water was coming in from above ... and we got a perfect shut-off."

ILLINOIS BASIN

"... Yes, and we also use it very successfully to perform squeeze jobs on casing leaks."

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"... We found that plugging back is no problem with the Baker Cement Retainer method."

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"... Sure we had bottom water trouble on No. 2, but not after we did that squeeze job with a Baker Cement Retainer."

ROCKY MOUNTAIN TERRITORY

"... Of course you can use that Baker Cement Retainer for a Casing Bridge Plug ... and it makes a mighty efficient one, too."

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"... And by squeeze cementing we reduced the gas/oil ratio from 26,300:1 to 366:1 ... and the Baker Cement Retainer functioned perfectly."

COMPLETE DETAILS concerning the Baker Cement Retainer and its many important applications are given in Baker Broadcast No. 17-A. A copy of this comprehensive 40-page treatise will gladly be sent upon request.

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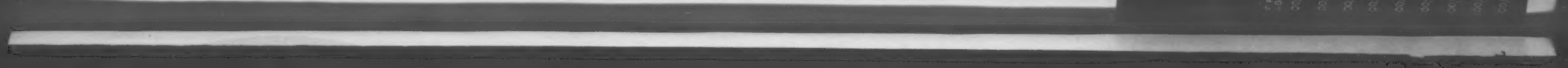
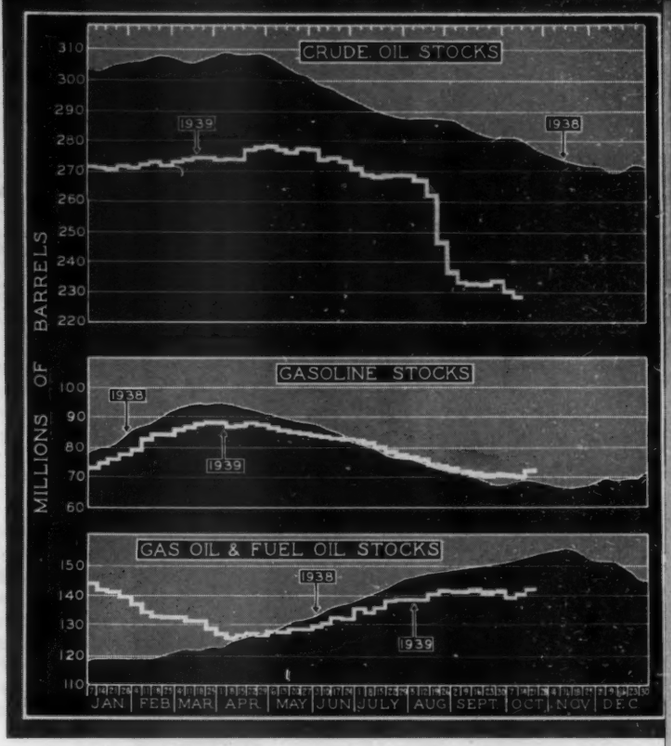


Trends

Crude Oil Output Increases to Near Peak of Last July



NATIONAL crude-oil production last week was the highest in the history of the industry with the exception of the week ending July 29, this year. The output of every state exceeded the Bureau of Mines' recommendation for October and was also in excess of allowables in states having conservation bodies.

CRUDE PRODUCTION *3,768,625 bbl. daily average—up 73,076 bbl. One year ago 3,246,507 bbl.*

CRUDE STOCKS *229,870,000 bbl. as of October 14—down 1,694,000 bbl. One year ago 277,001,000 bbl.*

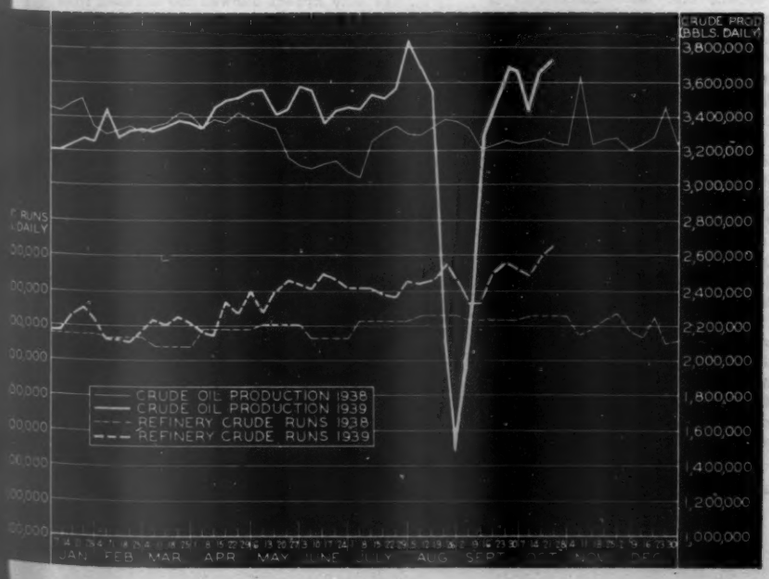
GASOLINE STOCKS *72,122,000 bbl. as of October 21—up 859,000 bbl. One year ago 69,215,000 bbl.*

GAS AND FUEL OIL STOCKS *141,496,000 bbl. as of October 21—up 1,079,000 bbl. One year ago 152,823 bbl.*

REFINERY RUNS *3,650,000 bbl. daily week ending October 21—up 50,000 bbl. One year ago 3,251,000 bbl.*

While crude markets continue strong, economists of the industry are in agreement that the trend toward greater crude output reported in recent weeks, coupled with the high rate of refinery runs, is unwarranted and if continued will nullify a statistical situation which is generally favorable at this time.

The Bureau of Mines' recommendation for November published elsewhere in this issue points to a strong demand situation, but present crude-oil and refinery operations are in excess of the expected requirements for next month. In this connection the bureau's report shows there will be no large increase in export demand due to war. Elaborating on this phase of the demand, at the T.N.E.C. hearing in Washington last week, a representative of the bureau said an investigation had shown that the principal exporting companies did not expect any increase in petroleum shipments from this country the last quarter of this year over the same period in 1938. Private reports from the coastal areas outside California indicate that owing to curtailed shipments to countries at war, exports are running behind the recent summer months and the fall of 1938.



In the domestic end the outlook is generally strong for the rest of this year and the early part of 1940. Changes in the demand for the various products is one of the reasons refiners have had difficulty correlating their operations. In general, refiners have faced a large increase in demand for light and heavy fuel oils, with prospects that this situation will continue through the fall and winter months.

The difficulty of the average plant operator is to adjust his operations so that he can take care of this demand for heavy oils and at the same time not accumulate gasoline stocks too rapidly. Most market students state that the gasoline, and not fuel oil, needs should control this plant problem and that the production of excess gasoline in order to supply the fuel-oil market is never justifiable.

Reflecting the delayed export movement, gasoline and some of the other products are easier at the Gulf Coast in spot quotations. Lubricants and wax continue to be the strongest products in both export and domestic markets.

The completion of two more wells in northern Mississippi has served to widen interest in the exploratory possibilities of that section.

DAILY AVERAGE PRODUCTION FOR WEEK

	Oct. 21, 1939	Bur. Mines Oct. est. of demand	Oct. state allowables	Oct. 14, 1939
Oklahoma City	104,100	.....	.....	108,625
Seminole fields	38,400	.....	.....	37,125
Remainder of state	282,800	.....	.....	279,600
Total Oklahoma	425,100	424,200	424,200	425,350
East Texas	492,448	.....	.....	492,848
West Texas	259,096	.....	.....	244,850
North Central Texas	128,400	.....	.....	120,450
Texas Panhandle	71,397	.....	.....	52,247
East Central Texas	88,698	.....	.....	81,600
Gulf Coast Texas	376,949	.....	.....	368,898
Southwest Texas	97,600	.....	.....	96,200
Total Texas	1,514,588	1,444,800	1,392,000	1,457,093
North Louisiana	66,200	.....	.....	66,980
Gulf Coast Louisiana	196,000	.....	.....	197,200
Total Louisiana	262,200	260,300	258,404	264,180
California	637,100	594,800	598,300	627,750
Kansas	174,850	170,600	170,600	164,125
Arkansas	65,370	56,100	65,300	64,870
Eastern fields	101,900	99,400	.....	101,000
Illinois	325,266	275,500	.....	330,100
Michigan	62,441	61,000	.....	63,091
New Mexico	114,910	114,200	114,200	114,000
Rocky Mountain area	84,900	89,400	.....	83,990
Total United States	3,768,625	3,590,300	.....	3,695,549

Federal Control Condemned At I. P. A. A. Meeting

By D. H. STORMONT

FORT WORTH, Tex., Oct. 23.—Proposed federal control of the oil industry, centering around the Cole bill, occupied most of the discussion of the Independent Petroleum Association of America in its tenth annual meeting here October 18-20. Gov. Leon C. Phillips, of Oklahoma, subjected the bill to a penetrating analysis from a legal aspect and stoutly protested against federal encroachment. Arguments for federal regulation were expounded by William P. Cole, Jr., Maryland congressman, chairman of the subcommittee in charge of the bill. Other topics at the three-day session included taxation, supply with demand, and committee reports.

The meeting was attended by 750 independent operators from all producing states, with unanimous agreement that it was one of the most successful ever held.

Frank Buttram, president of Buttram Petroleum Corp., Oklahoma City, was elected president to succeed Charles F. Roeser, Fort Worth, who completed his fourth term. No other changes were made in the officers, who remain: Harold B. Fell, Ardmore, executive vice president; Russell B. Brown, Washington, D. C., general counsel; C. E. Buchner, Tulsa, executive manager; N. T. Gilbert, Tulsa, treasurer; and T. J. Steuart, Washington, D. C., assistant to the president.

Governor Phillips condemned the Cole bill, or any bill providing for federal regulation, as an unnecessary duplication of effort, because the oil-producing states and the Interstate Oil Compact Commission are now effectively preventing waste and conserving our oil resources. He outlined how the oil states had passed conservation laws to prevent physical waste, described the work of the Compact Commission, and proceeded to give his reason why the Cole bill was unnecessary.

"The national government," he said, "is without police power, but the Cole bill asserts as a declaration of policy that, to maintain an adequate national defense and regulate interstate commerce, it is necessary for congress to prevent avoidable waste of petroleum products. This bill is purely a conservation measure. The question of market demand or demand and supply is in no way considered. By its terms the bill is an unqualified endorsement of the methods and practices invoked by the oil-producing states in their conservation laws as recommended by the Interstate Oil Compact Commission. I subscribe to the view that there is no need for the duplication of effort and expense in the matter."

Governor Phillips criticized the bill as giving an appointive office broad discretionary powers, in addition to legislative, judicial, and executive power. This, he felt, would give the federal commissioner almost dictatorial powers, and he believed such unusual powers should not be granted to any appointive federal official. In his opinion, if ever federal control is imposed on the industry, the day of the independent operator will be past.

In his discussion of "Oil From the Standpoint of National Control," at the annual dinner Friday night, Mr. Cole said in part:

"While many petroleum technologists and economists assure us that the petroleum resources of the United States are ample, that there is no occasion for their conservation and that there is no prospect of a shortage in the near future, it is my opinion that these so-called vast reserves of petroleum are largely dependent on much higher prices because of the greater development and production costs necessary to reduce the oil to possession. Due to the constantly increasing world demand for oil the day when oil can be obtained in abundance, quickly and cheaply from relatively shallow wells is rapidly drawing to a close, at least as far as the resources of the United States are concerned."

Mr. Cole hoped the committee's investigation could be completed by the end of the special session of Congress in order that the committee might

Extracts From

REGULATION OF PRODUCTION BY THE PETROLEUM STATES

By LEON C. PHILLIPS
Governor of Oklahoma

I do not believe there is any necessity for the federal Government to undertake to do that which the states are doing and have demonstrated they are able to do; namely, prevent avoidable waste in the production of oil. . . . The bill is purely a conservation bill. The question of market demand and supply is in no way considered. . . . Most of the state laws are superior to the proposed federal legislation in that they take into consideration the fact that the production of oil in excess of market demand is waste. Not only do the states prevent the waste of oil by sound engineering principles but they consider the reasonable market demand as reflected by the Bureau of Mines' estimates. . . .

The state laws are fairer and more equitable than the proposed federal legislation because they provide for ratable taking, commonly called proration. . . . In the proposed federal act, the commissioner is empowered to make rules and regulations to define wasteful methods and practices, which have the force and effect of law. It does not appear that the commissioner is obliged to consider the correlative rights of the owners of the property or to require ratable taking.

Of course, the enactment of the Cole bill will not destroy the fundamental rights of the states to exercise their police power in the enactment of and enforcing their conservation laws. If enacted into law this bill would simply furnish an additional policeman to the oil industry. It is conceivable that the state in the exercise of its sovereign rights would prescribe certain regulations, while the commissioner would prescribe different rules. . . . The provision in the law whereby the federal commissioner may cooperate with the state authorities is optional with the commissioner. He is only authorized and not directed to do so. A real conflict of authority is not only possible, but is probable.

As I view it there are many objectionable features in the Cole bill. Like many modern laws it sets up an appointive official with despotic powers. The appointive official is granted the right to enact legislation by prescribing rules and regulations. These rules and regulations have the force and effect of law, and a violation of same, or failure to obey any order of this commissioner, is punishable by heavy fine or imprisonment, or both, for each day's violation. . . . To determine whether any person has violated or is about to violate any provision of the act or any rule of the commissioner, the commissioner is constituted a court of inquiry and may require the accused to give evidence against himself under oath by requiring him to file a statement in writing concerning the matter to be investigated.

The commissioner is empowered to file a written complaint against a person before himself and after 5 days' notice to try him, and may make findings against him and issue a desist order. . . . The rules of evidence prevailing in the courts are not controlling in such hearing. The judgment of the commissioner is conclusive in all courts if supported by substantial evidence. . . . The only appeal allowed the accused from the rule or order is to the Circuit Court of Appeals. It is provided, however, that this court is bound by the findings of the commissioner if supported by substantial evidence. The commissioner may enforce his rules and regulations by injunctions or mandamus in any federal District Court without bond. The bill conveniently provides that the District Court of the District of Columbia shall have jurisdiction of such suits and any persons. Civil or criminal proceedings may be instigated by the commissioner in any state of the nation.

By the terms of the bill the commissioner is vested not only with legislative, judicial, and executive power but he is granted broad discretionary powers. Repeatedly, the bill uses the words, "The commissioner is authorized and empowered." Nowhere is he directed. I do not believe in vesting such unusual powers in any appointive federal official. Such power if exercised should be kept nearer home. . . .

further study various fields. The committee would expect the federal government agencies, in support of H.B. 7372, to be able to prove a prima facie case in support of the findings and declarations of policy embodied in the bill.

In the Thursday afternoon session the Cole bill received additional attention. For the purpose of discussion, Don Emery of Phillips Petroleum Co., Bartlesville, Okla., took the stand that some federal control was desirable, and George A. Hill, Jr., Houston Oil Co. of Texas, Houston, took the negative side.

Mr. Emery pointed out instances where, he argued, conditions could not be adequately controlled by the states alone, naming liquor as one problem. He then brought out how federal legislation had aided the oil industry by passing the Connally Act, giving states protection against "hot" oil.

The proposed bill, however, ignores states as producing entities and all will be handled as one big state, he said, and, if adopted, the states would be powerless to control production. Another admitted fault was that the bill provides no means of raising production if stocks are not adequate, thus the difference would have to be made up from increased imports.

(1) W. R. Boyd, Jr., A.P.I.; George A. Hill, Jr., president, Houston Oil Co., Houston; Jack Shannon, Snowden & McSweeney Co., Fort Worth. (2) N. T. Gilbert, treasurer, I.P.A.A.; Frank Buttram of Oklahoma City, new president. (3) Burdette Blue, chairman, public relations committee, Bartlesville, Okla.; and E. L. Connelly of Tulsa. (4) Winston P. Henry, president, Sedwick and Putnam Oil companies, Houston; E. L. Smith, independent operator, Dallas, Tex.

Mr. Emery asked if there still exists a problem beyond the scope of the Connally Act that requires federal legislation. If so, is there a crisis existing in the oil industry that would require this legislation? If this crisis exists, can the remedy be accomplished by the proposed legislation? If not accomplished without additional legislation, is it

Extracts From

OIL FROM STANDPOINT OF NATIONAL LEGISLATION

By W. P. COLE, JR.
Congressman of Maryland

At this time, in the midst of an important investigation of the petroleum industry, I am mindful of the freedom from government regulation, both state and national, but at the same time I am keenly aware of the breakdown in some instances of the ability of this industry to handle its own affairs and of the failure of some state agencies to likewise possess the essential regard for the general welfare of a nation of which such state is a part and of an industry, the assets of which are an indispensable governmental requirement. . . . It seems that avoidable physical waste still occurs in oil production, and that wasteful practices are to be found in some states which have enacted conservation laws and in some states which do not have such laws. . . .

The compact, as originally presented to Congress and on two subsequent occasions for extension, was limited specifically to conserving oil and gas by the prevention of physical waste from any cause, and expressly declared that its purpose was not to authorize the member states to limit the production of oil or gas so as to stabilize or fix prices. . . . Our committee does not yet have sufficient information to warrant any conclusion as to this recent motion of the Compact Commission (the recent shutdown for 15 days) but it is a matter of real concern. . . . A serious situation would arise if the Compact Commission, which is authorized only to prevent physical waste, should prove to be a medium through which state authorities may, whenever they feel conditions call for it, completely stop the production of crude oil and jeopardize the interests of those who consume petroleum products. . . .

Our committee may find itself interested in oil operations on lands owned by the United States. . . . it is to be expected that our committee will review the organization of the oil activities of the federal Government. We may inquire into the relationships which exist between the federal agencies and the state regulatory commissions. . . . It may be permitted to our inquiry to know something of the value and timeliness of federal research on oil. The critical period through which we are now passing will make it necessary and advisable for our committee to consider national defense in connection with the Petroleum Conservation Act of 1939. . . .

Many of you have read and perhaps studied the bill which our committee will consider. If you have, you will know there is nothing in the measure to support recent allegations that a producer would have to go to Washington to procure a certificate of convenience and necessity before he could drill a well, or that, if a state should produce more oil than was shown in the estimates of the Bureau of Mines, an administrator would step in and tell the state what it would have to do. Neither is there anything in the measure to support the thought that refining and marketing would be regulated. . . .

This legislation simply means that when wasteful practices are permitted to exist and continue, with a flagrant disregard on the part of the industry and of the states as to their duties in the premises, it then becomes the problem of the federal Government. . . . This legislation now and at all times in the future will be intended to assist the states and not to usurp their duties. Some may not want any assistance. Some may not want the assistance embodied in the bill, but such assistance is apparently becoming one of primary need and importance and it will remain, I am sure, for the calmness and deliberate judgment of our committee and ultimately of Congress, following a complete investigation of the subject, to say to just what extent such is necessary at this time. . . .

We have recognized the right of the states to handle and control the production of this industry. We have felt that the problem is not too big for the states if they sincerely want to solve it; at the same time, the problem is not one which will tolerate abandonment or trifling by the states. The country as a whole has the right to demand that petroleum, belonging to no state or individual but a natural national resource, must be conserved and must not be wasted.

Retiring president, Charles F. Roeser, Fort Worth; Miss Pauline Rae Huddleston, Oklahoma City, winner of the grand award of the essay contest sponsored by the I.P.A.A.; Larry E. Smith, research director, Tulsa

better to be left uncontrolled? If the proposed legislation is rational, is it better that the problem go uncontrolled or use federal assistance?

Regarding his first two questions, he admitted that no crisis existed in the industry and that passage of the Cole bill would not solve any existing problems. Congress, however, he said, has the power under the Constitution to pass bills similar to the Cole bill to prevent oil produced from moving in interstate commerce. The Interstate Compact Commission does not have this power.

Mr. Hill, in condemning the proposed legislation, made short work of its possibilities and the need of federal regulation. Since it was admitted, he said, there was no crisis in the industry that required the passage of the bill, and, if passed, it would not solve any of the industry's existing problems, why should it be adopted? He further criticized the bill for providing specifically that rules of evidence would not obtain, and for failure to specify what constituted physical waste. He regarded it as "silly" to assume that allowables could be distributed on a basis acceptable to the various fields of the various states, since engineers cannot agree on optimum producing conditions and equitable method of allocating the production in one field.

In its final session the association unanimously adopted a resolution recommending to the president of the United States and to Congress that legislation of the type proposed in the Cole bill be abandoned. It further stressed that in case of a national emergency, every state, local and personal interest would be subordinated immediately to the national welfare, and that the industry would promptly cooperate and conform to the national requirements.

Wirt Franklin, Ardmore, Okla., asked that the executive committee be given power to act in the interests of the association in any emergency that might arise, without the formality of calling a special membership meeting to endorse the acts of the committee.

Charles F. Roeser and others opposed the granting of such power to the committee, saying no national crisis would arise so fast the membership could not get together to discuss action. Upon motion the proposal be tabled Mr. Franklin's was the only dissenting vote.

In the committee report on balance of supply with demand, Harold B. Fell, committee chairman, said:

"In view of the generally more favorable conditions there appears to be justification for believing the industry should expect a continued improvement and a more healthy and profitable period. There is danger, however, that the large import rate, excessive refining operations resulting in wasteful stocks of refined products, excessive production and reckless production in uncontrolled areas may prevent or hinder an early return to normal conditions."

The committee recommended that gasoline stocks be reduced an additional 5,000,000 bbl. before December 31 (compared with an increase of 2,500,000 bbl. during the last quarter of 1939), and at that time approximate 65,000,000 bbl. It hoped the management of the refineries responsible for excessive runs will meet their obligations to the conservation program by reducing their runs to sound economic levels during the remaining months of the year.

Regarding crude production during the last quarter, Mr. Fell estimated total production of the United States should be about 3,300,000 bbl. daily, with 2,770,000 bbl. being produced east of California, to balance supply with demand. These estimates did not provide for further reduction in crude storage, he said, as it was believed such reductions can be accomplished more easily during the summer.

Senator Clint Small of Amarillo, Tex., in his address Friday morning, said Texas producers are to blame for the apparent inequities existing in the distribution of the state's daily allowable between pools and between operators in fields. He said if equity is to be attained producers must all "get in the harness and forget their selfish interests."

The address given by Miss Pauline Rae Huddleston, of Oklahoma City, winner of the grand award in the association's essay contest, did much to lighten the meeting. Miss Huddleston reviewed impressions of the industry she had gained in writing her essay, and then brought out the importance of the industry to the welfare of Oklahoma City and the state as a whole.

In the president's annual address, Mr. Roeser urged oil men to take a broader view of their problems.

"Too often," he said, "we are inclined to let our horizon be circumscribed by our own immediate and personal interests. That is only natural. Under normal circumstances our first duty is to those who are dependent upon us; they should not, however, be our last. We are all parts of a great industry. We cannot prosper or look to a future filled with opportunity unless that whole industry is in a healthy condition, and we should make our own personal contributions toward keeping that body in wholesome condition."

W. A. Delaney, Jr., of Ada, Okla., chairman of the tax policy committee, spoke on "Oil Tax Problems in the Next Congress."

Russell B. Brown, general counsel, in his annual report emphasized the general trend toward sentiment for federal control.

The drastic cut in the price of crude last August offered additional impetus to the cause of federal control, Mr. Brown said, adding:

"When some in the industry indulge in unjustified and uneconomic conduct such as occurred during last August, new strength is given those groups who had been and are today insistent that the petroleum resources of the nation should be under the definite control of the federal Government. Incidents such as that may destroy the confidence which has been developed through years of careful planning for the elimination of waste, for the promotion of exploratory work for the wise and economic supply of petroleum products in an increasing amount and of an improved quality."

Addresses were also given by Burdette Blue, Indian Territory Illuminating Oil Co., Bartlesville, Okla., on "Next Steps in I.P.A.A. Public Relations"; "Industrial Responsibility in a Republic," by Harold B. Fell; and "The Stake of the Royalty Owner in Oil Legislation," delivered by Sam T. Allen, Sapulpa, Okla.

New members to the executive committee (who cannot succeed themselves) are: C. F. Buchner, vice president of W. C. McBride, Inc., of St. Louis, Mo., who succeeded H. D. Atha, of Mount Pleasant, Mich.; J. F. O'Donohoe, president of Petroleum Producers Co. of Wichita Falls, Tex., who succeeded J. S. Bridwell; and Clyde Pape, secretary-treasurer of Selby Oil & Gas Co., of Tulsa, who succeeded H. H. Stalcup, of Tulsa; Wirt Franklin, who took the elective place formerly held by Frank Buttram, though he previously had been a member as immediate past president, and Mr. Roeser, added as immediate past president member.

Holdover members, in addition to the officers, are: J. A. Aylward, Aylward Production Co., Wichita, Kans.; Winston P. Henry, Putnam Oil Co., Houston; C. A. Lester of Lester & Duffield, Inc., Dallas; Parker L. Melvin, of Matson-Town-Melvin Oil Co., Bradford, Pa.; and Van S. Welch, of Welch, Flynn & Yates, Inc., Artesia, N. M.

Six new state vice presidents were named, and 48 new directors. For Arkansas, J. K. Mahoney of MacMillan Petroleum Corp., El Dorado, was named vice president to succeed T. H. Barton, of Lion Oil & Refining Co.; G. H. Blankenship, of Centralia, vice president for Illinois, to succeed P. E. Taggart, of Big Four Oil & Gas Co., Bridgeport. C. F. Buchner was named for Missouri to give that state its first vice president. Paul Stock, of Yale Oil Corp., Billings, was named vice president for Montana to follow W. M. Fulton, of Fulton Petroleum Corp., Shelby. New York was given its first vice president by election of John M. Lovejoy, president of Seaboard Oil Corp. Mills Bennett, of Mills Bennett Production Co., Houston, was named fifth vice president for Texas, representing the southwest district.

Among entertainment features of the meeting was a barbecue given Thursday evening by E. A. Landreth, president of Landreth Production Corp., Fort Worth, at his lodge on Eagle Mountain Lake, west of Fort Worth.

Illinois Basin Section

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Special article on Illinois geology by W. V. Howard on Page 34

J. E. SHERBORNE
Spoke on phase behavior

JOE HOOK
Oil umpire engineer

R. W. FRENCH
Technical committee

W. H. GEIS
Chairman, Petroleum Section

Southern California Section of A. I. M. E. Hears Oil Papers

By L. P. STOCKMAN

LOS ANGELES, Calif., Oct. 23.—The southern California section of the A.I.M.E. was host to 520 members and guests at a 2-day session in Los Angeles October 19 and 20, an attendance due to the wide scope of topics chosen. The meeting was followed by an informal dinner at which Donald B. Gillies, president of the A.I.M.E., delivered an after-dinner talk on steel. The opening address of the meeting was delivered by W. H. Geis of Union Oil Co., chairman of the Petroleum Division of the A.I.M.E. (Abstracts of papers will be found on Page 134.)

Balloting is now in progress to fill offices of the southern California section and since the nominees are unopposed the nomination is equivalent to election. The result of the election will be announced later. The nominees are: Harry P. Stolz, Stanley & Stolz, consulting engineers, for chairman; Henry Mulryan, Gladding & McBean, vice chairman; Walter Abel, Division of Corporations, State of California, secretary-treasurer. The new executive committee will consist of Herbert Hoover, Jr., president, United Geophysical Co.; H. T. Wyatt, Shell Oil Co., Inc., and H. B. Menardi, Penhoel-Menardi Engineering Co. Nominees for offices of the Petroleum Division are T. V. Moore to succeed W. H. Geis as chairman; C. J. Coberly to succeed T. V. Moore as associate chairman; B. C. Craft to succeed himself as secretary-treasurer. The executive committee of the national section will consist of T. V. Moore, chairman ex officio; W. H. Geis, W. B. Heroy, C. V. Milliken, H. H. Power, and E. A. Stephenson.

Behavior of Hydrocarbons

The paper of John E. Sherborne of Union Oil Co. on Fundamental Phase Behavior of Hydrocarbons caused much discussion. W. L. Jarvis, Texas Co., submitted an opinion in which he called attention to: "The application of phase behavior is an integral part of estimating reserves of individual properties or fields by means of volumetric methods.

"The soundest way to estimate the newer reserves is believed to be by volumetric methods. This procedure consists of determining an estimate of the amount of oil underlying a field or property and then applying a recovery factor to obtain an estimate of the producible reserves."

The next step in estimating reserves by volumetric methods is where the pressure, volume, and temperature relationships are used. Mr. Sherborne has described the terms formation volume factor and liquid shrinkage factor, the latter being the reciprocal of the formation volume factor. Since a barrel of oil, measured under surface conditions when in the reservoir with its constitu ent gas, occupies more than a barrel of space within the reservoir, the void volume in the reservoir available to oil and gas must be divided by the average formation volume factor, or multiplied by the shrinkage factor, in order to obtain the barrels of oil present under reservoir conditions. The formation volume factor depends on the formation pressure, temperature, and composition and relative amounts of the oil and gas contained in the reservoir. From this point in the estimation, only a recovery factor is needed to obtain an estimate of the reserves.

"To date, volumetric behavior and solubility-relation work have not been extensive and the results published or made available for general use have been confined to but few fields. At present the California Institute of Technology at Pasadena and Standard Oil Co. at its West Coyote field in Orange County have the only equipment in the West capable of satisfactorily determining these data. This equipment is quite elaborate and rather expensive but the data obtained are so valuable for numerous applications that there is certainly justification for further installations so that a larger volume of data can be obtained. At present, if P.V.T. data are not available on the field in question, it is necessary to use data obtained under similar conditions of temperature, pressure, gravity, and gas-oil ratio from fields where such work has been performed and is available. This practice is likely to introduce some error, for the results would not necessarily be identical. For this reason P.V.T. work should be performed on the oil and gas from all fields where volumetric estimates are to be made, in order to obtain accurately their solubility relations and volumetric behavior."

A feature of the southern California section during the year has been the unusual success of the newly organized group of junior members in the Los Angeles district, Junior members must be less than 33 and qualified to hold subordinate positions in engineering, mining, geological, or chemical work. The junior members in their meetings have placed particular emphasis on round-table discussions. Carlton Beal presented a paper covering the organization and activities of the junior members.

An informal dinner climaxed the 2-day session Friday evening at which G. A. Joslin, chairman of the southern California section of the A.I.M.E., presided and, in addition to Donald B. Gillies, A.I.M.E. president, the chair introduced E. De Golyer and D. C. Jackling, past presidents. The institute staff was represented by A. B. Parsons, Chester Naramore, and E. J. Kennedy, Jr.

Report of Technical Committee

The technical committee, headed by Richard H. Pence as chairman, and comprising R. E. Allen, A. H. Bell, W. S. Eggleston, Hallan N. Marsh, Ernest K. Parks, Stanley Herold, E. K. Soper, R. P. McLaughlin, Harry Stolz, F. W. French, and W. H. Geis, were given a vote of thanks. The arrangements committee was composed of R. E. Swarthout, chairman, and Eldon Dunlap, Vic King, and Lee Huebel. Officers of the southern California section of the A.I.M.E. are: G. A. Joslin, chairman; Harry P. Stolz, vice chairman; C. O. Sanford, secretary-treasurer, and N. W. Wickersham, assistant secretary. Other members of the board are Walter D. Abel, W. S. Eggleston, Henry Mulryan, and Ernest K. Parks. R. P. McLaughlin, R. W. French, Jr., and John C. Young acted as chairman, vice chairman, and recorder at the opening session October 19. For the afternoon session these offices were filled by Harry Stolz, Eldon N. Dunlap, and F. G. Taves. At the morning session on October 20 R. E. Allen was chairman, T. A. Atkinson was vice chairman, and Floyd Merritt was recorder. At the afternoon session on Friday V. H. Wilhelm acted as chairman, Carlton Beal was vice chairman, and W. S. Eggleston was recorder.

SPARKS . . . FROM THE NEWS

PEACE ARGUMENT: A strong argument for peace is given in a late report which shows following prices prevailing for regular-grade gasoline in U. S. cents per gallon: Paris, 33.7; Berlin, 59.6; Rome, 73; London, 35. Most of the prices are accounted for by special taxes.

STRONG FINISH: The Farish testimony brought the T.N.E.C. oil investigation to a close with an excellent summary of the industry's progress. Unfortunately, governmental inquisitors appear more interested in the minor failures than in the major accomplishments.

DISTINCTION: The distinction between war demand and expected war demand is becoming clearer. Expectations were in hand 2 months ago. The demand isn't here yet.

HEADS HANG: There's no reason for getting puffed up over some all-time records. For instance, the week ending October 14 — refinery runs of 3,600,000 bbl.

OBJECT LESSON: The effects of wide-open Illinois development are apparent in the production trends of several fields—pertinent exhibits for those who are now considering a conservation act for that state.

KEROSENE LIGHT: Blackouts and fear of air raids have driven French and English peoples from the cities to the country, where they are using kerosene for light. The export demand for that product reflects that development.

1940 OUTLOOK: Automobile manufacturers at the New York show said they would manufacture at least 4 million of the 1940 models. That assures another record in domestic gasoline demand.

CATALYTIC PRODUCT: With several large units recently completed or scheduled for completion over the next 30 days, tens of thousands of motorists in all parts of the country will shortly be using catalytically refined gasoline.

WAR DEMAND: A Bureau of Mines' representative says his investigation indicates that the war will not increase the export demand for petroleum from this country the last quarter of 1939. The early 1940 trend must await developments which cannot be gaged at this time.

MISSISSIPPI FEVER: With a second completion indicating a large proven area, the oil fever in northern Mississippi resembles that of early Illinois development in 1937.

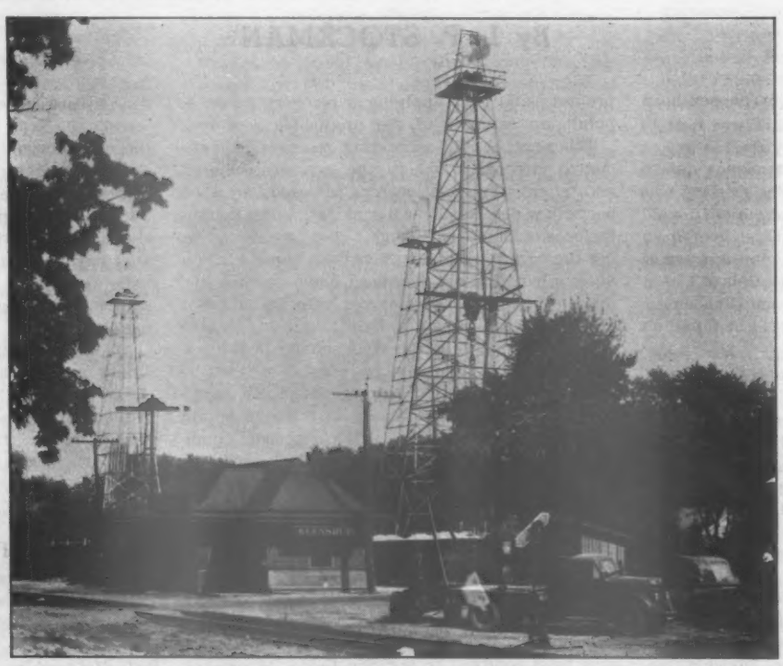
INDICATOR: Congressman Cole's I. P. A. A. talk showed that he is familiar with recent oil developments and also indicated the matters in which his committee will be interested when hearings on his federal control bill start in the near future.

IN REVERSE: For months heavy fuel oil was a drug on the market at many middle-western refining centers. A heavy industrial demand has reversed that situation and the product is as strong as the proverbial horseradish.

UNITED FRONT: After several well-directed blasts by Oklahoma's Governor Phillips and others, independent oil producers at the I.P.A.A. meeting were convinced more than ever they don't want any extensions of federal control.

NEWEST NIGHTMARE: Now they are talking about Russia stalking into Iran and Iraq.

CLOSE SPACING . . . . .



Derricks among the houses greet the eye of arrivals to the village of Keensburg, Wabash County, Illinois

Cross-Examination of Farish Covers Wide Range

WASHINGTON, D. C., Oct. 24.—Committee discussion of public questions common to all large corporations caused W. S. Farish, president of Standard Oil Co. (New Jersey), to digress repeatedly from his prepared summary before the T.N.E.C., and the committee appeared to be more interested in his views as head of one of the country's largest corporations than in his estimation of the present status of the oil industry.

Demonstrating that the hearings are not primarily an investigation of the oil industry, but a study of corporation practice, concentration of economic power, and the competitive status of small businesses, the questioning turned to such subjects as federal licensing of corporations, standards for corporate accounting, ethics of corporation management, and protection of small stockholders.

Mr. Farish attempted to give an oral summary of his prepared statement with intervals for questioning at the end of each subject. But he was continually interrupted. At times he read sections of his prepared paper where the committee wanted more detailed exposition of his views, but more often he was taken far afield from his outline.

Defends Management

The Standard executive stoutly defended the ethics of corporate managers, saying that even though it is impossible to get stockholders to attend meetings or for an ordinary stockholder to alter corporation policies or change personnel of management, directors look upon their jobs as a profession and are subject to many checks, both governmental and within the company. He asserted that in the oil industry most directors grew up in the business and are working officers of their companies and are not brought in from other lines of activity simply to attend directors' meetings.

Committee members recalled many classic cases of corporation mismanagement and defalcation, but Mr. Farish stuck to his view that, regardless of some such instances, corporation directors cannot manage without regard to the interests of stockholders.

"I have never been conscious of any limit on size," Mr. Farish testified, "except as size itself carries handicaps which serve to limit it." Frank admission was made that nonintegrated companies are at some disadvantage against the position enjoyed by integrated operations.

Leon Henderson, of S.E.C., picked up the witness's statement that the industry has reduced costs in production, refining, and transportation and inferred that these savings had not been fully reflected in the price of their products.

This led Chairman O'Mahoney to ask Mr. Farish to submit an analysis later, showing cost factors which affected ultimate prices in 1933 as compared with the first 6 months of 1939.

Discussion of the extent to which integrated companies control the industry resulted in the witness pointing out that, whereas the committee listed only 20 integrated companies, there are actually over 200 integrated units in the industry.

Chairman O'Mahoney said he was very much interested in the Farish analysis as to the situation within the corporations in the industry and made quite a point of the practice of chartering corporations under the liberal incorporation laws of Delaware. This, the chairman said, indicates the need for some sort of federal check to insure a paramount authority over corporations which would reach the situation where a corporation is chartered in one state, carries on its operations in another state and has headquarters in still another state. Senator O'Mahoney developed the premise that stockholders really have little say over the direction of corporations and hinted the desirability of federal policing to guarantee the protection of the rights of widely diffused stockholders.

Mr. Farish replied that no one could guarantee the honesty and integrity of corporation officials any more so than of any other human. The witness declared unequivocally that "crooks have a poorer chance to carry on in large industries than in small ones. The very existence of a large corporation absolutely depends upon the highest standard of conduct. It is inconceivable that a crook can last any time. We do have a few defalcations, but my philosophy is that there is less opportunity in the big companies because he has more checks and chances of observation of his conduct."

The witness admitted that "the extent to which small stockholders can check upon corporate policies and practices is on hazy ground" but maintained that their rights are secure and redress is available upon bringing up matters at annual stockholders' meetings. Mr. Farish admitted that an individual holding a considerable block of stock in a corporation could not oust the management, but he would not agree that the perpetuation of corporation management tends to concentrate tremendous economic power in the hands of a relatively few persons. He pointed out that corporation managers generally are men who have come up in the organizations over a long period of years and have demonstrated outstanding ability.

The line of discussion turned to the practice of some corporation managers, in times of depression, increasing their own salaries while dividends were not being paid to stockholders; the payment of bonuses to corporation executives; loans to corporation officials, etc.; but Mr. Farish took the view that there should be no checks imposed upon corporation management to assure the rights of small stockholders, saying he knew of none that could be applied.

Speaking of Delaware corporations, Mr. Farish declared there is a tendency on the part of individuals, and the federal Government as well, to take advantage of the Delaware incorporation laws. He said, most emphatically, it is desirable for the states to compete among themselves as to the liberality of their incorporation laws.

The course of the discussion led to the flat-footed declaration by Mr. Farish that "no large corporation can exist today that hasn't public opinion with it. If it hasn't, it's just a bad egg." He added that publicity is the best protection for everybody.

Chairman O'Mahoney declared the question which interests him is the degree to which standards of corporate management should be set in the

(Continued on Page 40)

Harris & Ewing

T.N.E.C. INTERLUDE—*W. S. Farish, president of Standard Oil Co. (New Jersey), with W. R. Boyd, Jr., vice president, American Petroleum Institute, and Prof. R. S. Meriam, Havard School of Business Administration*

Illinois Geologic Trends Better Defined

By W. V. HOWARD

TABLE 1—PARTIAL LIST OF LOWEST FORMATIONS TESTED BY WILDCATS IN ILLINOIS (JAN.-SEPT. 1939)

County—	Pennsylvania	Chester	St. Genevieve	St. Louis	Dev.-Sil.	Trenton	St. Peter
Adams	0	0	0	0	0	0	2
Bond	0	0	3	1	1	0	1
Brown	0	0	0	0	1	0	0
Champaign	0	0	0	1	0	1	0
Christian	1	0	2	0	1	0	0
Clark	4	0	1	1	1	0	0
Clay	0	4	5	1	0	0	0
Clinton	1	6	1	2	0	0	0
Coles	4	1	1	2	1	0	0
Crawford	4	0	1	1	0	0	0
Cumberland	1	2	1	0	1	0	0
Douglas	1	0	0	0	0	0	0
Edgar	0	0	1	1	2	0	0
Edwards	0	1	5	0	0	0	0
Effingham	1	2	2	1	0	0	1
Fayette	0	3	2	0	0	0	0
Franklin	0	1	2	2	0	0	0
Fulton	2	0	0	0	0	0	0
Gallatin	1	3	2	3	0	0	0
Greene	0	0	0	0	0	1	0
Hamilton	0	0	1	0	0	0	0
Hancock	0	0	0	0	2	0	0
Jackson	0	0	1	0	0	0	0
Jasper	0	0	4	3	0	0	0
Jefferson	0	3	13	4	2	0	0
Lawrence	3	4	0	0	1	0	0
Macon	0	0	0	0	1	1	0
Macoupin	0	0	0	3	1	0	0
Madison	0	0	0	2	5	0	0
Marion	1	2	11	2	2	0	0
McDonough	0	0	0	0	2	0	0
Monroe	0	0	0	1	0	3	1
Montgomery	6	0	0	2	1	0	0
Morgan	0	0	0	0	1	0	0
Moultrie	0	2	0	1	1	0	0
Perry	0	4	1	2	0	0	0
Pike	0	1	0	0	0	0	0
Randolph	0	0	0	1	0	3	0
Richland	0	1	5	0	0	0	0
St. Clair	0	0	0	0	1	4	1
Saline	2	4	0	2	0	0	0
Sangamon	0	0	0	0	0	2	1
Schuyler	0	0	0	0	0	2	0
Shelby	0	1	3	3	1	0	0
Tazewell	0	0	1	0	0	1	0
Wabash	1	3	8	1	0	0	0
Warren	0	0	0	0	0	0	1
Washington	2	9	3	2	1	0	0
Wayne	0	0	14	2	0	0	0
White	0	2	8	2	0	0	0
Williamson	0	1	1	1	0	0	0
Total	35	60	103	50	30	18	8
Field openers	2	11	8	1	1	1	0

THE Illinois oil fields continue to hold the spotlight, and as activity in the area slowly takes on a more orderly aspect, our knowledge of the geological conditions underlying the recent developments is slowly crystallizing. Many of the hypotheses formerly held have been confirmed and others have dropped out of the picture.

In an article published in The Oil and Gas Journal in November 1936 the writer called attention to certain underlying features. Of these, the importance of pre-Pennsylvanian structural movements is generally recognized. What was called the Colmar-Centralia trend has been shortened and is now established as the Carlinville-Centralia fold. In addition to this anticlinal trend and the parallel Ava-Dupo trend, an alignment along other northwest-southeast axes can be seen elsewhere in the basin.

Similarly, the subordinate north-south structural trend is becoming still more apparent in the elongation and alignment of fields in this direction.

The third direction of folding, north-northeast by south-southwest, has become most evident in the southeastern part of the basin, both in the Cisne-Noble trend and the newly developed Storms-Allendale trend in White and Wabash counties.

With intensive drilling, the number of potential pay horizons has increased, notably in the Chester series, where the Aux Vases, Renault, Tar Springs, Paint Creek, and Waltersburg sands have proven productive.

The pre-Mississippian formations have again been disappointing, although the Devonian-Silurian (Niagaran) and Trenton have yielded enough scattered production to warrant continued optimism. The St. Peter sandstone continues to be a wonderful reservoir with no oil.

Wildcatting in 1939

An incomplete record of wildcat wells completed during the first 9 months of 1939 is presented in Table 1.

Of the 304 wells listed, less than 20 per cent penetrated the full Mississippian section, and of these only two were productive. The percentage of productive tests in pre-Mississippian formations is thus 4 per cent as compared with 9 per cent in Mississippian and Pennsylvanian tests.

Practically all of the tests to lower horizons were on the western and northern rims of the deep basin. This area contains a great number of inviting structures, especially where the major structural trends come up on the basin rim. However, many core-drilled structures on coals have been found to lose their closure in the lower formations because of local thickening of intermediate strata. Thus a large percentage of coal structures reflect buried hills rather than buried structures and the search for Niagaran and lower oil becomes correspondingly complicated.

Drilling in 1939

Table 2 shows the completions by counties during the first 8 months of 1939 with a few later wildcats.

The general picture presented by this table is

TABLE 2—SUMMARY OF RESULTS OF DRILLING IN ILLINOIS, JANUARY TO AUGUST, 1939

County—	Comp.	Oil	Prod.	Average	Gas	Dry	Per cent	Wildcats	Per cent	Prod.	Per cent	Dry	Per cent
Adams	2	0	0	0	0	2	100	2	100	0	0	2	100
Alexander	1	0	0	0	0	1	100	1	100	0	0	1	100
Bond	7	0	0	0	0	7	100	7	100	0	0	7	100
Champaign	2	0	0	0	0	2	100	2	100	0	0	2	100
Christian	4	0	0	0	0	4	100	4	100	0	0	4	100
Clark	9	2	35	18	0	7	78	7	78	0	0	7	100
Clay	154	140	61,514	439	0	14	9	10	7	1	10	9	90
Clinton	38	23	1,202	52	0	15	40	10	27	0	0	10	100
Coles	14	4	33	8	0	10	71	9	64	2	22	7	78
Crawford	6	2	9	5	0	4	67	6	100	2	33	4	67
Cumberland	7	0	0	0	0	7	100	5	71	0	0	5	100
Douglas	1	0	0	0	0	1	100	1	100	0	0	1	100
Edgar	4	0	0	0	0	4	100	4	100	0	0	4	100
Edwards	8	1	30	30	0	7	88	6	75	1	17	5	83
Effingham	7	0	0	0	0	7	100	7	100	0	0	7	100
Fayette	655	608	144,111	237	2	47	8	5	1	0	0	5	100
Franklin	7	2	200	100	0	5	71	5	71	0	0	5	100
Fulton	2	0	0	0	0	2	100	2	100	0	0	2	100
Gallatin	14	3	298	99	0	11	79	9	64	1	11	8	89
Greene	1	0	0	0	0	1	100	1	100	0	0	1	100
Hamilton	1	0	0	0	0	1	100	1	100	0	0	1	100
Hancock	2	1	3	3	0	1	50	2	100	1	50	1	100
Jackson	1	0	0	0	0	1	100	1	100	0	0	1	100
Jasper	7	0	0	0	0	7	100	7	100	0	0	7	100
Jefferson	42	15	2,871	191	0	27	64	22	52	1	5	21	95
Johnson	1	0	0	0	0	1	100	1	100	0	0	1	100
Lawrence	20	2	29	15	7	11	55	8	40	0	0	1	100
Macon	1	0	0	0	0	1	100	1	100	0	0	1	100
Macoupin	4	0	0	0	0	4	100	4	100	0	0	4	100
Madison	7	1	6	6	0	6	85	7	100	1	14	6	86
Marion	838	799	267,363	330	0	39	5	18	2	1	6	17	94
McDonough	3	1	7	7	0	2	67	2	67	0	0	2	100
Menard	1	0	0	0	0	1	100	1	100	0	0	1	100
Monroe	9	180	5	45	0	4	44	5	56	1	20	4	80
Montgomery	9	0	0	0	0	9	100	9	100	0	0	9	100
Morgan	1	0	0	0	0	1	100	1	100	0	0	1	100
Moultrie	4	0	0	0	0	4	100	4	100	0	0	4	100
Perry	7	0	0	0	0	7	100	7	100	0	0	7	100
Piatt	1	0	0	0	0	1	100	1	100	0	0	1	100
Pike	1	0	0	0	0	1	100	1	100	0	0	1	100
Randolph	4	0	0	0	0	4	100	4	100	0	0	4	100
Richland	51	45	4,725	103	0	6	12	6	12	0	0	6	100
St. Clair	28	21	1,341	63	0	7	25	6	21	0	0	6	100
Saline	8	0	0	0	0	8	100	8	100	0	0	8	100
Sangamon	3	0	0	0	0	3	100	3	100	0	0	3	100
Schuyler	2	0	0	0	0	2	100	2	100	0	0	2	100
Shelby	12	0	1	28	0	11	92	12	100	1	8	11	92
Tazewell	2	0	0	0	0	2	100	2	100	0	0	2	100
Wabash	23	9	2,823	314	0	14	61	13	57	2	15	11	85
Warren	1	0	0	0	0	1	100	1	100	0	0	1	100
Washington	76	51	5,123	100	0	25	33	17	22	1	6	16	94
Wayne	211	182	26,201	144	0	27	12	16	8	3	19	13	81
White	12	4	827	207	1	7	59	12	100	5	42	7	58
Williamson	3	0	0	0	0	3	100	3	100	0	0	3	100
Total	2,248	1,826	517,810	283	10	412	18	304	14	24	8	280	92

Note—Some September wildcats included.

remarkably similar to that of the whole of 1938. The table shows 15 more completions than in 1938, nine fewer gas wells and four more dry holes. Initial productions of producing wells average 271 bbl. in 1938 as against 283 bbl. in 1939.

In detail, these are changes of considerable importance. Of the 14 counties in which production was found in 1938, only Bond has been dropped from the 1939 list. Ten counties have been added to the list of producers, namely, Coles, Edwards, Franklin, Gallatin, Hancock, Madison, Monroe, Shelby, Washington and White. The significance of these developments is discussed below.

Structural Trends

Certain structural trends are becoming increasingly well developed in the Illinois basin. These trends are reflected in many ways. The most obvious method of establishing a trend, and the most dangerous, is by simply lining up a number of fields and calling it a trend. We are all acquainted with men who talk about two wells which are "right in line," but when these lines can be continued through a number of highs and when other lines appear which run parallel to the original lines, it is possible to place more confidence in them.

The existence of trends may also be demonstrated by the thinning of beds along a definite axis. Sometimes strata thin over highs because of erosion during or shortly after the period of deposition. This indicates an uplifting of part of the area relative to the rest, or the existence of a local positive area in which the time of the movement can be definitely determined. In other cases the positive area was already in existence and the beds thin as they lap up on the preexisting high.

A third method of establishing trends is to note the position of the axes of individual folds. Rocks are warped and folded in complicated patterns, but the axes of the local folds line up parallel to the main regional trends.

Thus regional folding may be established by three types of maps: (1) Regional maps showing the location of structures, (2) isopachous maps showing the thinning and thickening of individual beds or series, and (3) structure contour maps showing the axial trends of minor folds reflecting the regional trend.

In Illinois the existence of northwest-southeast trends is plainly demonstrated by both regional and isopachous maps, but not by large-scale structure-contour maps. The relationships of these trends to oil production was formerly masked by the La Salle anticline which runs in a northnorthwest by south-southeast direction from Wabash County into the northern part of

(Continued on Page 43)

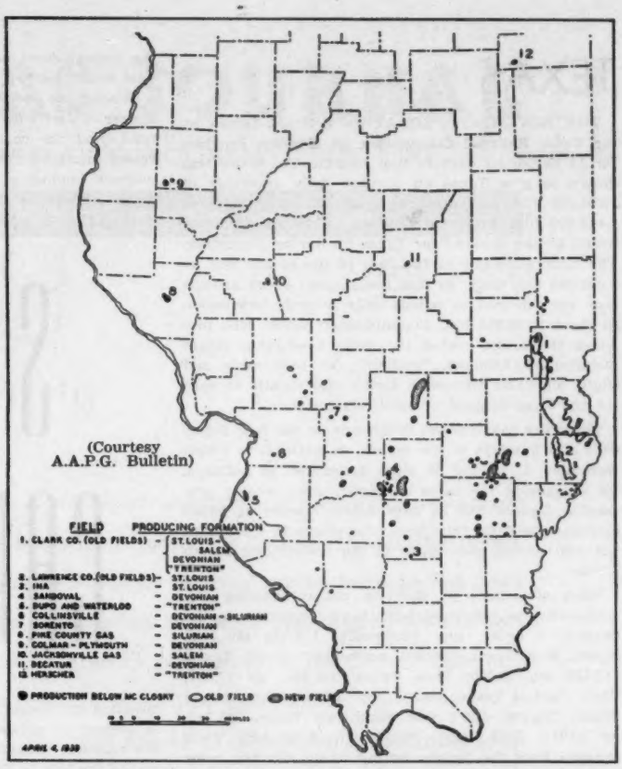
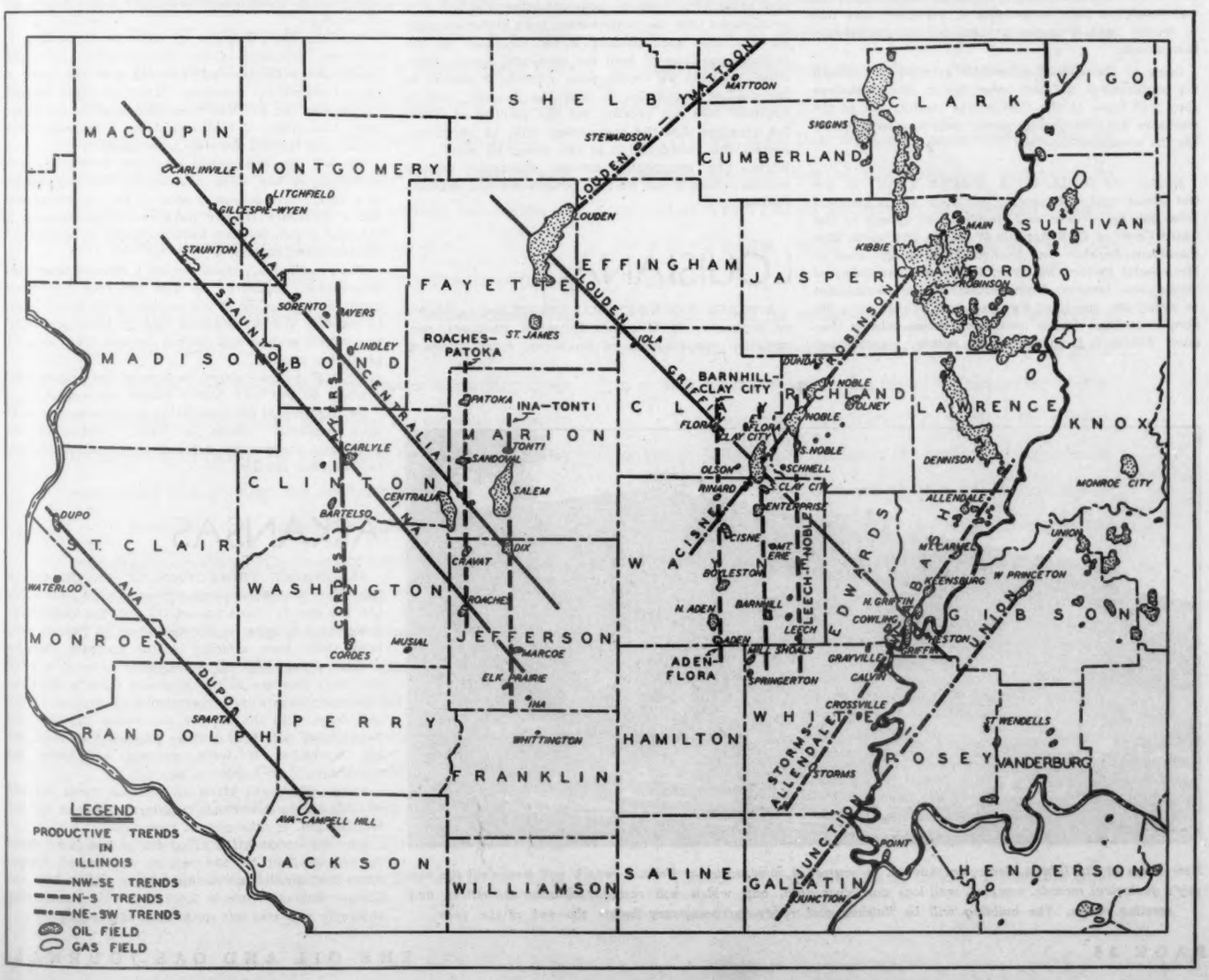

(Courtesy
A.A.P.G. Bulletin)
FIELD PRODUCING FORMATION
1. CLARK CO. (OLD FIELDS) - ST. LOUIS - SALEM
DEVONIAN "TRENTON"
2. LAWRENCE CO. (OLD FIELDS) - ST. LOUIS
3. INA - ST. LOUIS
4. SANDOVAL - DEVONIAN
5. DUPO AND WATERLOO - "TRENTON"
6. COLLINSVILLE - DEVONIAN - SILURIAN
7. SORENTO - DEVONIAN
8. PINE COUNTY GAS - SILURIAN
9. GOLMAR - PLYMOUTH - DEVONIAN
10. JACKSONVILLE GAS - SALEM
11. DECATUR - DEVONIAN
12. HERSCHER - "TRENTON"
PRODUCTION BELOW MC CLOSKY
OLD FIELD
NEW FIELD
APRIL 4, 1939

Fig. 1—(Top) Map showing location of fields producing from horizons lower than the McClosky. Fig. 2—(Below) Map showing fields and trends



STATE CAPITALS

TEXAS

THE NOVEMBER PRORATION ORDER, issued by the Texas Railroad Commission on Monday, provides for 11 shutdown days in that month. The order was drawn to give Texas an average daily allowable of 1,396,225 bbl., as compared with the daily total of 1,444,000 bbl. which the Bureau of Mines estimated would be the demand for Texas oil during November. The basic allowable at the first of the month will be 2,096,614 bbl. daily, so that the 11 days of no production are expected to reduce daily average production to about 1,396,225 bbl. Commissioner Sadler, who prepared the order, stated the daily production figure included a 15,000-bbl. "cushion" for new wells and slight allowable increases during the month to care for the local demand of small refineries.

The order calls for the shutdowns on the four Saturdays and Sundays of the month, in addition to which November 1, 15 and 30 were designated as holidays. By so spacing the extra shutdown days, weekly production figures will be kept below Bureau of Mines estimate the first, third and fifth weeks in the month but will exceed the figure in the second and fourth weeks.

Basic allowables by districts, not considering any shutdowns, as compared with those contained in the October 1 order, are: Panhandle, 113,572 bbl., up 22,999; East Texas, 690,000, unchanged; North Texas, 142,126, up 13,570; West Texas, 318,683, up 17,151; West Central Texas, 66,968, up 2,078; East Central Texas, 122,166, down 269; Southwest Texas, 335,712, up 16,914; Gulf Coast, 307,387, up 8,459 bbl. Field changes from the figures set out in the October order were of a minor nature, resulting almost entirely from well completions during this month. A good portion of the 80,000-bbl. increase in the basic allowable, which was 2,015,712 bbl. on October 1, however, was due to special field increases granted by the commission this month.

Some of the special allowables granted this month are continued in the new order, but in other instances they will lapse at the first of the month. All of the increases granted during recent hearings were solely for the month of October.

RIGHT TO DRILL ON A 20-ACRE TRACT in the Old Ocean field of Brazoria County, in which the field rules call for 40-acre well spacing, was upheld by the Third Court of Civil Appeals at Austin last week. This important decision was handed down in the case of Mrs. Nellie Pollard Dailey v. Railroad Commission of Texas, and resulted from refusal of the commission to grant the appellant right to drill a well on a 20-acre tract, Mrs. Dailey owning no more land in that area. Abstracts from the court's opinion, overturning the commission's order which had been sustained in trial court, follow:

"Under the facts stated the landowners were as a matter of fact entitled to drill one well on the 20-acre tract, and the commission acted arbitrarily and unreasonably in denying the permit . . . It has been the uniform holding of this court that the inherent right of the landowner to recover the oil beneath his land is the primary basis for the exception to prevent confiscation or protect vested rights and that such right is deemed to outweigh other consideration for which the rule was promulgated. The Supreme Court so construed the rule in Brown v. Humble. . . .

"Appellees Harrison & Abercrombie seek to justify the commission upon the ground that they offered to pool appellant's property with adjoining acreage. If it be assumed that the conservation laws authorize pooling and that such pooling is not inhibited by the fundamental laws of both the state and nation, upon which question we do not pass, a complete answer to the pooling contention is that the spacing rule in question does not provide for the pooling of lands, but provides that the commission will, by exception, protect the vested rights of the owner of small . . . tracts. The commission cannot arbitrarily require pooling where it has no rule prescribing and defining pooling."

LOUISIANA

A THREE-JUDGE FEDERAL COURT was petitioned on September 21 to enjoin Ernest S. Clements, conservation commissioner of Louisiana, from enforcing the October proration order for the Jennings field in Acadia Parish on grounds that he "ignored every test and standard" of law in issuing it.

The petition was filed by Alfred C. Glassell and Alfred C. Glassell, Jr., members of the firm of Glassell & Glassell, who claim that while they own or lease 40.23 per cent of the production area and are entitled to 44.54 per cent of productivity, the order permits them to produce only 25.86 per cent of the field allowable.

Claiming a daily "discriminatory" deficiency of 2,149 bbl. and charging that final hearing on their objection will not be held until February 14, 1940, complainants allege a total possible loss of $325,000 in the interim and further charge Mr. Clements with discrimination in the matter of drilling permits issued on an acreage basis.

ERNEST S. CLEMENTS, conservation commissioner, released on Monday the November oil allowable for Louisiana, setting production at a total of 258,994 bbl. daily, a decrease of 490 bbl. from last month. South Louisiana production was decreased 887 bbl. to a total of 191,835 bbl., and North Louisiana production was increased 1,377 bbl. to a total of 67,159 bbl.

ILLINOIS

AN ILLINOIS OIL-CONSERVATION BILL, submitted by three producers' associations as an "agreed" bill, promptly stirred a controversy before the legislature's budgetary commission.

George Harsh, Jr., Centralia, president of the newly organized Illinois Oil Producers Equity Association, charged in a hearing on October 19 in Springfield that "the whole bill is designed to create a monopoly and put the independent producers and refiners out of business."

This view was disputed by Alex W. McCandless of Robinson, president of the Illinois-Indiana Petroleum Association, who asserted it would curb the waste of oil and natural-gas resources. Mr. McCandless told the commission the bill was supported also by the Petroleum Association of Illinois and the Independent Producers and Royalty Owners Association.

The bill, Mr. McCandless said, was drawn by representatives of the three associations for introduction in a prospective special session of the legislature this fall if Governor Horner includes oil conservation in the session call. Backers included major companies and independents, he added.

The proposed bill would set up a three-member state commission, appointed by the governor for 6-year terms at salaries of $9,600 a year, with broad power to regulate the oil industry and to limit production to conform with actual market demand from each oil-producing pool.

Mr. McCandless claimed backers of the proposed bill produce 90 per cent of the Illinois oil output.

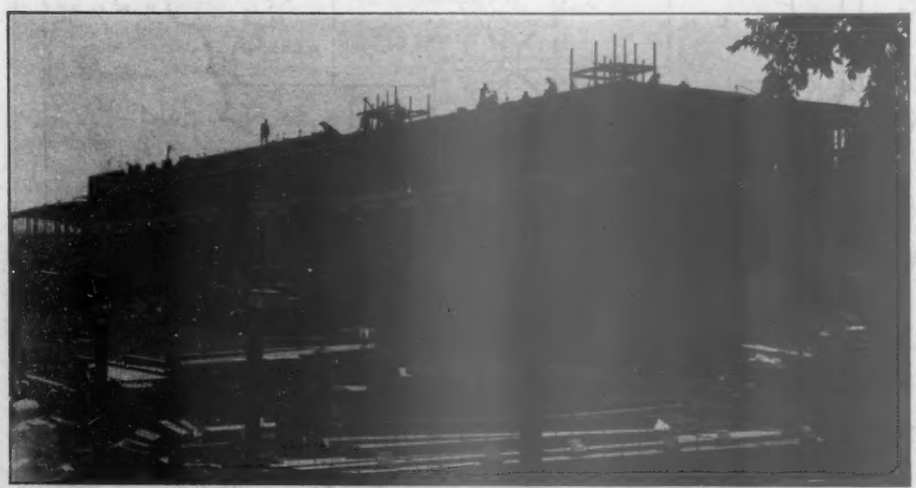
Mr. Harsh said his association would submit a statement probably within a week. Meanwhile the budgetary commission delayed any recommendations to Governor Horner.

ARKANSAS

ALLOWABLE PRODUCTION OF CRUDE OIL in November in Arkansas was increased to at least 68,952 bbl. per day by the Arkansas Oil and Gas Commission following a hearing on October 19 at El Dorado. Only flush fields were affected by the increase. Meeting operators' requests, the commission granted a 2,500-bbl. daily increase to the Magnolia field in Columbia County, which will be permitted to produce 17,500 bbl. daily, with the further stipulation that an additional 2,500 bbl. daily will be allowed that field during November if wells nearing completion are brought in.

Village field was given an increase from 994 bbl. to 1,300 bbl., and Buckner field an increase of 350 bbl. to 2,500 bbl. to take care of new wells.

Lion Oil Refining Co. asked for an increased figure for Schuler field, but the petition was denied, Schuler Jones-sand production being left at 15,000 bbl. and Schuler Reynolds lime at 2,402 bbl. The Atlanta field allowable was also left unchanged at 450 bbl.



New home of the Illinois Geological Survey, in course of construction at Urbana, which will house all the survey's geological records, samples, well logs and other data, and which will contain laboratories, offices and meeting rooms. The building will be finished and ready for occupancy before the end of the year

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Heartening

According to the latest advices from Illinois there has been an agreement on compromise conservation legislation. It is heartening to the industry at large to know that differences finally have been adjusted and that progress now can be made with a conservation program.

It would have been tragic if excesses in production in Illinois should have led to involvement with the federal Government. This has been a great danger.

The oil industry of the whole country has been solidly in favor of Illinois adopting a conservation law. This is best illustrated by the action taken at the annual meeting of the Independent Petroleum Association of America at Fort Worth last week in voting unanimously against the Cole bill and declaring similar opposition to any federal interference in the business.

The tone of the notably constructive meeting at Fort Worth was definitely in favor of conservation, but under state regulation.

There have been frequent threats emanating from Washington, with Illinois providing a powerful example as a particular reason for the federal Government having something to say about the oil business.

However, the constructive forces of the industry and producers generally heartily commend the progress to date and expect early enactment of the bill, which, it is understood, has finally been worked out.

While it may not be exactly what everyone wanted, yet this act can be strengthened as time goes on and experience points out the need for widening its scope.

Illinois is now the fourth largest oil-producing state in the union. An estimate published on Page 58 of this issue shows that the reserves of Illinois exceed a half billion barrels, with still other potential areas yet unexplored.

A prolonged continuance of present practices could have had but one result. The decline in production of several fields would be as rapid as the increase has been until a settled-production level had been reached which would be a small percentage of the peak. Production costs run high in such an operation.

The state enjoys an exceptionally favorable location in relation to markets, with adequate outlets and competitive advantages that other areas cannot overcome. It is in an admirable position to get the most out of these advantages over a prolonged period by adopting a conservation policy.

It is apparent that the more conservatively Illinois operators produce their oil the more they are going to get out of it, and Illinois will remain an important oil state for a much longer period if it decides to produce its oil judiciously.

But it will be necessary to operate its discoveries on the basis of sound engineering practices if the state is to stay near the top in the list of oil-producing states.

The successful educational campaign for conservation in Illinois has followed the universal experience in the industry. When a flood of flush production threatened the industry 12 years ago, the question suggested itself: Was there not some way to curb these repeated periods of ruinous overproduction?

Oldtimers scoffed at the notion that producers could be brought to agree on curtailment. But the alternative was so disastrously familiar that conservation was deemed worth trying.

Illinois has been going through the same experience with like results. East Texas once produced a million barrels a day but the state listened to wiser counsel.

Illinois will be fortunate in locking the stable door before the horse is stolen.

November Domestic Demand
4 Per Cent More This Year

The daily average supply of domestic crude oil estimated by the Bureau of Mines to meet the market demand in November 1939 is 3,620,000 bbl. This is 29,700 bbl. more than the estimated demand for October and 5.7 per cent more than the actual demand in November 1938.

Daily average crude-oil production and runs to stills during the 5 weeks September 2 to October 7 were 3,492,000 and 3,497,000 bbl., respectively. During this period total crude-oil stocks declined 5,374,000 bbl., 295,000 of which was foreign stocks, leaving a net decline in domestic crude oil of 5,079,000 bbl., or 145,000 bbl. daily. The addition of this stock decline to the production indicates that the apparent demand for domestic crude oil during the period was 3,637,000 bbl. daily. This was about 12,000 bbl. in excess of the bureau's estimate for September, reflecting chiefly larger runs to stills and a smaller reduction in gasoline stocks than was forecast.

ESTIMATED DAILY AVERAGE CRUDE-OIL DEMAND BY STATES (Barrels)

(As no changes in crude-oil stocks are involved in these estimates, they represent demand rather than production)

State—	Forecast November 1939	Forecast October 1939	Actual demand November 1938
Texas	1,444,000	1,444,800	1,309,000
California	596,000	594,800	640,000
Oklahoma	429,000	424,200	546,000
Illinois	303,000	275,500	97,000
Louisiana	259,000	260,300	290,000
Kansas	169,000	170,600	145,000
New Mexico	111,000	114,200	113,000
Wyoming	63,000	69,000	54,000
Michigan	63,000	61,000	62,000
Arkansas	57,000	56,100	50,000
Pennsylvania	52,000	48,200	47,000
Montana	16,000	16,500	14,000
Kentucky	16,000	14,800	19,000
New York	15,000	13,200	12,000
West Virginia	10,000	10,000	9,000
Ohio	9,000	9,000	11,000
Indiana	4,000	4,200	3,000
Colorado	4,000	3,900	3,000
Total	3,620,000	3,590,300	3,424,000

While runs to stills have been in excess of recent forecasts, yields of distillate-fuel oils have been lower than anticipated. Consequently, distillate stocks east of California are below normal. The trends of market demand indicate a large relative increase in the amount of light heating oils required during the winter. To meet this situation the bureau raised its estimate of required runs to stills for October and a further increase is indicated in the forecast for November. Even these estimates may prove inadequate unless distillate yields are substantially higher than last year. Improvement in the position of gasoline stocks depends primarily on the extent to which increased domestic and export demand may reduce the usual seasonal rise.

The disturbance in shipping conditions due to the war is being adjusted slowly but reports received from exporters of motor fuel and crude petroleum do not indicate, as yet, any substantial increases over the relatively large exports of last fall.

***Motor fuel, domestic demand*—The estimated domestic demand for motor fuel is 46,700,000 bbl., or about 4 per cent more than the actual demand in November 1938, which was abnormally high.**

Motor-fuel exports have been estimated as 3,900,000 bbl., or 200,000 bbl. more than the actual for November 1938.

Stocks of finished and unfinished gasoline on August 31 amounted to 72,335,000 bbl. Statistics indicate they declined about 2,100,000 bbl. during September, which would bring them to approximately 70,200,000 bbl. as of September 30. The bureau estimates an increase of 400,000 bbl. in finished gasoline stocks for November.

Benzol and direct sales of natural gasoline have been estimated as 1,050,000 bbl., making refinery production 49,950,000 bbl. This is distributed among the various districts a follows (thousands of barrels): East coast, 6,540; Appalachian, 1,750; Indiana-Illinois, 9,020; Oklahoma, 3,050; Kansas, 2,500; inland Texas, 3,530; gulf Texas, 13,410; gulf Louisiana, 1,590; inland Louisiana-Arkansas, 880; Rocky Mountain, 1,280; and California, 6,400.

***Runs to stills*—Natural gasoline to be blended at the refineries is estimated at 8.7 per cent of the total gasoline production, or 4,350,000 bbl. The yield of straight run and cracked gasoline is estimated as 44.4 per cent. The application of this yield to the production of 45,600,000 bbl. gives crude runs of 102,700,000 bbl., or 3,423,000 bbl. daily. Foreign crude runs are estimated as 2,400,000 bbl.**

Exports of crude oil are estimated as 5,800,000 bbl. The estimate for fuel and losses is 2,500,000 bbl.

The total demand for domestic crude oil in November 1939, as indicated, is 108,600,000 bbl. or 3,620,000 bbl. daily.

***Crude oil demand by states*—The breakdown of the total estimated daily demand for domestic crude oil of 3,620,000 bbl. gives the following crude requirements by states of origin. As these requirements may be supplied either from stocks or from new production, contemplated withdrawals from crude-oil stocks must be deducted from the bureau's estimate of demand to determine the amount of new crude required. These estimates are not recommendations for production but represent the projection of actual market trends by states.**

DEATHS

JAMES NEWTON HUNTER, 54, general superintendent of the Tulsa pipe-line division of Gulf Refining Co., died October 19 in Tulsa from a heart ailment. He was born January 11, 1885, at Bradford, Pa., son of a man who started hauling oil in barrels, the then universal method of transportation. Graduating from Bradford High School, he attended Mount Herman Academy at Mount Herman, Mass., studying chemistry to take up pharmacy, but changed to engineering. From boyhood he had worked as pumper, roustabout, rig builder, and tool dresser. Removing to Tulsa in 1910 he began with the Gulf companies as timekeeper and warehouseman, continuing engineering studies at night, particularly interested in soil analysis and pipe preservation. His knowledge of pipe-line problems led to continuous advancement until he was placed in charge of operations.

HOWARD G. JONES, 63, former vice president of Standard Oil Co. of Ohio, died October 20 at Cleveland, Ohio. At 16 he became an office boy for John D. Rockefeller.

JOHN W. LANE, 40, secretary-treasurer of Motor Fuels Corp. of Lubbock, Tex., died October 22 in Lubbock following an automobile accident. Until July 15, this year, he had served in the same capacity with Cosden Petroleum Corp. for 11 years. He was with Mariand Oil Co. before joining Cosden.

Tankers Leaving Gulf For the West Coast

HOUSTON, Tex., Oct. 23.—Due to continued curtailment of shipments to the war zones, occasioned not only by lack of demand but by hesitancy to risk tankers, carriers not in regular service are finding it increasingly difficult to obtain cargoes at Gulf Coast ports and are being shifted to the Pacific Coast, where the increasing demand for oil from the Far East is expected to keep them busy.

Within the past several days a large number of tankers have come into Gulf Coast ports on the chance of picking up cargoes but, unable to do so, have sailed immediately for the West Coast through the Panama Canal. Many were Scandinavian boats, which have been mostly affected, as much of their business in the past has been with the countries now at war. They now are prohibited by their governments from transporting oil into the war zone.

WEST VIRGINIA PETROLEUM ASSOCIATION

J. E. JONES
President

C. L. VORESS
Vice President

EDWIN F. PATRICK
Secretary

CHARLESTON, W. Va., Oct. 25.—Reduction of the state highway bonded indebtedness and the adoption of a constitutional amendment dedicating all automotive tax funds exclusively to highway financing were urged in resolutions adopted today at the annual convention of the West Virginia Petroleum Association, held at the Daniel Boone Hotel. J. C. King of Charleston, retiring president, presided. More than 400 identified with the petroleum industry in all parts of the state were in attendance.

J. E. Jones of Parkersburg was elected president for the coming year; C. L. Voress of Charleston, vice president, and Edwin F. Patrick of Charleston, was reelected secretary.

International

Mexico . .

Exports Decline Half Since the War Began

PETROLEUM exports from Mexico dropped 48 per cent during the first month of the European war, confirming the important position Germany played in absorption of Mexican oil from the time properties were confiscated. Although the war was the direct cause of halting Mexican shipments to Germany, traffic between the two countries was previously approaching a stalemate because the Reich was behind in payments to the extent of more than $5,000,000 on deliveries made prior to last September 1.

Contrary to what appears on the surface of Mexico's export statistics, there have been only 23,979 bbl. of asphalt shipped to Great Britain since the expropriation. Since expropriation it has been common practice for tankers to load in Mexican ports, clear for Lands End, England, and there receive orders for diversion to German and other European ports on the high seas. The practice of declaring the destination of Mexican oil cargoes as Lands End developed immediately after the confiscation when cargoes of Mexico's oil had difficulty in discharging at certain European and American ports.

Indicative of the part the war played in Mexican petroleum traffic is the report on known exports for August and September. Mexican shipments in August totaled 1,939,874 bbl. of crude and products. In September, the first month of the war, shipments dropped to 1,006,560 bbl., a loss of more than 48 per cent.

Since the confiscation Germany has received nearly half of Mexico's petroleum shipments. By tracing the shipments to their ultimate destination and disregarding the declaration made by tanker owners upon sailing from Mexico, it is revealed that Germany received 11,291,362 bbl. of total shipments of 23,646,607 bbl. Germany's receipts of Mexican oil from the time the expropriation decree was issued March 18, 1938, through September 1939, consisted of: gas oil, 3,526,247 bbl.; Panuco crude, 2,521,469 bbl.; residual fuel oil, 2,409,640 bbl.; crude gasoline, 1,745,799 bbl.; Poza Rica crude, 948,108 bbl.; kerosene, 21,332 bbl., and asphalt 15,235 bbl.

An agreement was reported closed a few weeks ago between Mexico and Italy whereby the latter country will exchange rayon for increased petroleum shipments; but the potentialities of this trade are definitely limited because of restrictions imposed on civil consumption by Mussolini and increased receipts of Albanian crude. In the 18 months since expropriation Italy has received 4,551,536 bbl. of Mexican crude and products and stands as the second largest customer under Germany. A good portion of the shipments to Italy were against the promised delivery of two tankers under construction in Italian shipyards. One of the boats is reported to have been launched, but no report of its delivery to Mexico has been received.

Negotiations have been started for delivery of two German tankers to Mexico in partial settlement of $5,000,000 due the latter country on previous deliveries of oil. The two tankers involved in the negotiations are the 4,327-ton Emmy Friederich and the Tineassmusen which have been anchored in the harbors at Tampico and Puerto Mexico, since the outbreak of war. Acquisition of the boats would permit the government oil agency to make deliveries to the Pacific Coast and to Lower California, areas that are currently drawing their supplies from upper California in the United States.

Private reports indicate that Mexican storage facilities are reaching the limit of capacity. Inability to build additional storage and the curtailment of shipping have placed unusual pressure on the stock facilities during the past 6 weeks and this development alone is thought responsible for optimistic statements over settlement of the expropriation issue coming from official Mexican quarters. Ambassador Najera of Mexico had an audience with President Roosevelt last week and issued an optimistic interview upon his departure from the White House. The Mexican ambassador revealed no details of any new proposal for settlement. Inquiries at offices of American and British companies in New York whose properties were seized indicated that no new negotiations had been started. Conversations with Mexico were broken off several weeks ago when President Cardenas sought settlement on premises entirely different from a basis previously agreed to in conferences with Donald Richberg, counsel for the companies.

A further pressure on Mexican economy is indicated by examination of the September exports of petroleum from Mexico. During the past month more than 75 per cent of the shipments consisted of crude oil which commands a smaller proportionate price than products in the world market. Recent upturns of crude oil shipments in proportion to refined products may be the result of accumulated difficulty in operating the refineries, the lack of maintenance and equipment replacements.

The accompanying tables show the details of Mexican petroleum exports for the period from March 18, 1938, through September and for August and September of this year.

MEXICAN EXPORT CARGOES (In barrels)

August, 1939

Destination—	Poza Rica crude	Panuco crude	Southern crude	Gasoline	Gas oil	Fuel oil	Kerosene	Total all products
Germany, August	36,783	126,429	32,092	*247,566	393,727	.....	*8,725	845,322
Germany, no shipments in Sept.								
Italy, August	375,859	48,601	.....	.....	.....	.....	....	424,460
U. S. A., for dom. use	.....	227,406	.....	.....	.....	.....	....	227,406
U. S. A., Houston in bond for reshipment	442,686	.....	.....	.....	.....	.....	....	442,686
Total	855,328	402,436	32,092	247,566	393,727	.....	8,725	1,939,874

*64,514 bbl. of gasoline and the 8,725 bbl. of kerosene reported as taking refuge at Puerto Mexico.

September, 1939

Italy	266,500	.....	.....	.....	.....	.....	....	266,500
Montevideo, Uruguay	.....	.....	.....	.....	.....	83,000	....	83,000
Manchukuo (Dairen)	655	.....	....	7,857	.....	.....	6,548	15,060
U. S. A., for dom. use	.....	136,000	.....	.....	.....	.....	....	136,000
U. S. A., Houston in bond for reshipment	506,000	.....	.....	.....	.....	.....	....	506,000
Total	773,155	136,000	....	7,857	....	83,000	6,548	1,006,560

KNOWN MEXICAN EXPORTS SUBSEQUENT TO EXPROPRIATION DECREE OF MARCH 18, 1938, THROUGH SEPTEMBER 1939

Destination—	Kerosene	Poza Rica crude	Southern crude	Panuco crude	Crude gasoline	Gas oil	Residual fuel oil	Asphalt	Total known exports all prods.
United States	.....	.....	.....	1,182,831	.....	.....	.....	.....	1,182,831
England*	.....	.....	.....	.....	.....	.....	.....	23,979	23,979
Italy	.....	2,057,596	686,598	545,884	.....	81,645	1,172,637	7,176	4,551,536
Japan	6,548	85,155	.....	.....	7,857	.....	148,936	.....	248,496
Belgium	.....	266,625	86,900	147,047	103,100	.....	.....	67,445	671,117
Central and South America	27,284	.....	.....	.....	71,346	6,158	285,075	17,480	407,343
France	.....	.....	.....	.....	159,875	.....	.....	49,978	209,853
Scandinavian countries	.....	74,041	.....	227,682	145,530	.....	.....	104,959	552,212
Germany	21,332	948,108	103,532	2,521,469	1,745,799	3,526,247	2,409,640	15,235	11,291,362
All others	.....	131,112	.....	121,063	92,964	3,000	1,040	157,151	506,330
United States—shipments in bond for reshipment to foreign countries†	.....	3,138,397	.....	103,637	659,614	99,900	.....	.....	4,001,548
Total	55,164	6,701,034	877,030	4,849,613	2,986,085	3,716,950	4,017,328	443,403	23,646,607

*All shipments showing preliminary destination of Lands End, England, were diverted at sea to final destination of Germany and are included in totals of Germany.
†Shipment in bond to U. S. included the following known reshipments:

Germany	38,766	72,152	193,569
Italy	.....	13,096	876,121
Miscellaneous foreign countries, France, Sweden, S. America, Spain, etc.	1,082,193	209,498	949,190

The totals of known reshipments from U. S. to Germany and Italy are included in their respective general totals above.

Cross-Examination of Farish

(Continued from Page 33)

public interest, but reiteration by the chairman of his favorite topic, federal incorporation of corporations, moved Senator King to declare flatly that he, for one, is not willing to destroy state autonomy in that way; that a national standard is not needed.

The witness rejected the contention of Dr. Isador Lubin, commissioner of labor statistics, that use of the holding company in the industry permits subsidiary units to do things in concert which non-integrated companies acting together could not accomplish without incurring antitrust-law liability.

Suggestions by Vice Chairman Sumners that the Government fix standards of quality for gasoline met with quick rejection by Mr. Farish.

"Any attempt to standardize quality will be a backward step," he said, explaining that competition within the industry is constantly improving the quality of the product.

Pipe-Line Situation

"The pipe-line situation is one of the most interesting subjects of the whole discussion," Chairman O'Mahoney declared when the witness reached this subject.

Operation of pipe lines independent of production and refining could not succeed, Mr. Farish declared. "I am opposed to divorcement of pipe lines and I feel it would serve no useful purpose to anybody." He knew of no case where access to pipe lines was denied anyone.

Chairman O'Mahoney was impressed with the analogy that the small operator, like the small stockholder in a corporation, was unable to exercise any potent control over the pipe-line situation, amounting to the "independent producer being up against a huge wall of aggregate power." Mr. Farish said the analogy was not quite accurate since the small stockholder could not make much of a dent on management unless he makes an awful howl, whereas he can affect management if other stockholders go along with him.

In response to Vice Chairman Sumners, Mr. Farish declared he had nothing to say about statements that pipe-line profits are used to subsidize less profitable branches. "It is not a fact," he said. Mr. Sumners emphasized: "That's a very important phase of this problem," Mr. Farish said: "It is not so to me."

A round of discussion at this point prompted Mr. Farish to ask Chairman O'Mahoney whether the case is closed in his mind that the marketing business is operated at a loss, to which Senator O'Mahoney answered in the negative, saying he was anxious to show from Mr. Farish's testimony just what there is to the complaint that pipe-line operations subsidize marketing losses. Mr. Sumners interposed: "My impression as one member of the committee is there is substantial support in the record that major companies extract their profit before it reaches retailing and use it to put other retailers out of business."

"I am thoroughly familiar with the charges," said Mr. Farish. "All I can say is we do operate our marketing at a profit and do not put anybody out of business."

Mr. Farish stated that, out of about 400,000 station operators, the large percentage were making only a living. He declared complaints about using pipe-line earnings to injure retailers and jobbers come from a very small minority of the dealers. It all goes back to the effects of competition, and leads to whether Government should fix prices and guarantee all a profit.

Chairman O'Mahoney stressed that the committee has had such a volume of complaints it was a question whether steps should be taken to correct it. Mr. Farish observed such an objective could be accomplished only by a "Hitler form of government." Mr. Sumners interjected his opinion that if democracy of opportunity is not preserved it might be difficult to preserve democracy in government. "We don't believe you have democracy in opportunity in the industry," he declared.

The Texas congressman made the further significant statement that: "We got to propose some legislation—maybe."

The hearings were forced into the fifth week by the unscheduled calling of government technicians to extoll proration and unit operation. Officials of the Department of the Interior and advisers to the National Resources Planning Board were called at the request of Robert E. McConnell, of the advisory staff of the secretary of commerce. At the conclusion of their testimony, Mr. McConnell read a statement, labeled as the official position of the Department of Commerce, denouncing waste in the petroleum industry and urging complete governmental control of oil drilling and production.

Wilmer R. Schuh, chairman of the National Association of Petroleum Retailers, appeared to deny that his association is subsidized by major companies, and denied charges that he attempted to intimidate prospective witnesses before T.N.E.C., but he balked at answering questions about instructions sent by N.A.P.R. to Kansas City retailers on how to fight gasoline-price cutters. He pleaded constitutional immunity and the committee did not insist that he answer.

Asked by Chairman O'Mahoney as to what principal points he would include in a code for the industry, Mr. Schuh, demurring that it was "a big order," suggested: (1) Federal help for the refineries so they can obtain a reasonable price for their products and insure the continued existence of small refiners through the creation of a modified cartel operated by an allocation committee, with government sponsorship automatically withdrawn upon disclosure of any abuses; (2) promulgation of a Federal Trade Commission code of fair trade practices for the retail marketing of petroleum products; and (3) a rule barring subsidization of any retailer by any supplier through equipment, price, and station appointments' concessions.

What was described as a detailed analysis of the financing, accounting, and dividend policies of major companies was presented by Christopher Del Sesto, special assistant to the attorney general. The material was obtained from returns to the questionnaire from T.N.E.C.

No Hitler Here Yet

Chairman O'Mahoney contrasted the inconsistency of shut-in wells in his state, Wyoming, and wide-open flows in Illinois on the one hand and the improbability of federal laws reaching so definitely local a thing as real estate within the states as would be involved in compulsory proration or unit operation. Senator King's reaction was: "We haven't got a Hitler here, yet," issued with some heat.

"If we are going to limit production, should we not put some controlling device over distribution?" Chairman O'Mahoney queried. "Would not limitation of uneconomic use of petroleum be a logical follow-up?" Willis Ballenger of the Federal Trade Commission asked.

Alfred G. White, chief economist, Petroleum Economics Division, Bureau of Mines, was called to satisfy committee curiosity as to the origin, authorization, basis and purpose of the bureau's demand forecast suspect by the committee of having price-control implications.

Mr. White said control of crude production does not necessarily carry with it control of refined products. "What is the function of the report, conservation?" asked Senator O'Mahoney. "Primarily it is a conservation function relating to unnecessary production of oil above market demand," Mr. White replied. He emphasized that in short forecasts such as theirs, covering demand for a month ahead, there is no consideration of price.

Contrasting Views Provoke Chairman to Comment

Regarding the testimony by government witnesses Chairman O'Mahoney said to The Oil and Gas Journal representative:

"The testimony clearly throws into relief the contrasting views of those who for scientific purposes would control production for the purpose of conserving a diminishing resource and those who would abolish controls in order to have reduced prices.

"Also, so far as federal organizations are concerned, they generally disavow any direct purpose to use conservation as a price-fixing medium.

"No testimony developed before the committee should be interpreted as indicating a committee point of view."

The last paragraph was interpreted as a shaft in the direction of Robert McConnell, Commerce Department, who invited the government panel to emphasize the economic wastes in petroleum producing.

THE MARKETS*

CRUDE OIL: Sohio Corp. advanced its Salem, Ill., crude price to $1.05, meeting the highest posted price. Standard Oil Co. of Louisiana posted a 10-cent increase for crude in the Bunkie and Eola fields, coastal Louisiana, with a top price of $1.15 for 40-gravity oil and above. Illinois production fell off nearly 5,000 bbl. a day. The Tinsley field in Mississippi was made important by three new wells of substantial production.

REFINERY: Although difficulties attending ocean transport are diminishing, realization that war needs for most petroleum products are not likely to take the form of actual business for many months tends to curb market enthusiasm. Mounting gasoline stocks and excessive refinery runs are other sobering influences. Heavy domestic demand for seasonal products and expectation of oversea orders later are holding the general market steady, though in the Gulf Coast area gasoline has turned definitely weak.

TANK WAGON AND POSTED DEALER: Standard of Kentucky and Standard of Nebraska made local adjustments in gasoline and kerosene, advances and reductions being about equal.

FINANCIAL: Oils recorded a modest gain over the preceding week, following pretty closely the pattern set by the general market. Average of 30 representative stocks for week ending October 21: High, 29.78; low, 28.57; close, 29.14. Week ending October 14: High, 29.34; low, 28.30; close, 28.89.

*Detailed information in market section.

Proration, Farish Says, Is Greatest Problem

PRESIDENT W. S. FARISH, of Standard Oil Co. (New Jersey), concluded his prepared statement before the T.N.E.C. with the following:

And now I come to what I personally consider the greatest problem of the oil industry, namely, the problem of proration. This is an issue which, as compared with some of the problems that have commanded a great deal of attention at these hearings, is a much more central and significant one, not only for the industry but also for the whole country. From the standpoint of national economic policy, which is the prime concern of your committee, it is *the* petroleum problem. In fact, a great many questions which have occupied your attention during the course of these hearings have their origin in the difficulties that are being encountered in developing sound conservation standards.

Optimum production may be defined roughly as "the most oil at a reasonable cost," that is, the most oil that can be obtained without spending more on the addition to the supply than that addition is worth. The concept therefore embraces economic aspects as well as considerations of physical waste. The idea of optimum production involves several things: (1) The most economical recovery for a pool as a whole should be established at a rate that will maintain the bottom-hole pressures. (2) There should be proper well spacing to avoid unnecessary drilling costs. (3) Withdrawals of oil should be made ratably from each property owner's holdings, protecting correlative property rights and maintaining equilibrium within the reservoir. Under a condition of optimum production as thus defined, it will be possible to avoid almost entirely the injurious consequences of the rule of capture. This is the job of proration.

Naturally, the foregoing definition of optimum production is a statement of an objective. For a closer approach to a realization of this objective by means of the proration process, several things are required: (1) More extensive application of the best engineering practice, thus bringing about acceptance of standards of efficiency in production; (2) further development and acceptance on the part of the regulatory bodies and the industry as well of standards of equity not only within a field, but also between fields; and (3) a great deal of patience with slow evolution in a situation where varied and complex social interests are involved.

Future Supply

Whenever the topics of conservation and proration are discussed, the question is raised as to the probable extent of the nation's future supply of oil. Our proved petroleum reserves are estimated at something between 17 and 22 billion barrels, about 14 to 17 years' supply at the present annual rate of production. This concept of proved reserves is a technical one. It means reserves which have been tested by sufficient drilling to make possible a reliable quantitative estimate of the recoverable oil which they hold. The figure of approximately 17 to 22 million barrels represents a substantial increase over the estimates of earlier years, an increase attributable partly to technological developments such as deep drilling, partly to improvement in methods of finding oil, and partly to increased acceptance of the greater total output and more efficient recovery from oil fields brought about by delayed production, i.e., proration. The present figure can be regarded as a more reliable one than the estimates of earlier years. Proved reserves, however, do not include all the oil that exists; many new discoveries of oil doubtless will be made through the drilling of unproved acreage and the discovery of new pools. No one can tell exactly what the future discoveries will be, but while there is ample justification for prudence there is no occasion for alarm.

How rapidly new discoveries are made in relation to the rate at which existing reserves are exhausted will determine how large the nation's reserves will be in the future. Although there are apparently no notable new developments in oil-discovery procedures now on the horizon, it is not to be doubted that there will be continued technological advances along these lines and that these advances will play a part in future oil discoveries, how large a part no one can now say.

On the basis of optimum production, how much oil could be currently brought to the top of the ground? It is a personal judgment among most of us in the Standard Oil Co. (New Jersey) that if withdrawals of crude oil from underground reserves were to take place under conditions which would reduce waste to the practicable minimum, the rate of production might fall short of meeting the current market demand by possibly 200,000 to 300,000 bbl. daily. This judgment is based on the best information available, both on the size of reserves and on the most economical methods of production. It is also based on the company's experience in seeking to apply an optimum rate of production, wherever possible, to its own holdings. The executives of the Standard Oil Co. (New Jersey) have some confidence in this estimate. We know that it is an opinion, but we think that the weight of engineering experience supports this opinion.

Relation of Optimum Production to Price

Suppose the assumption is made that the optimum rate will be less than the current rate; what is going to be the effect on the consumer's pocketbook? It is fairly clear that changes on the supply side rather than changes on the demand side have been the most conspicuous causes of major fluctuations in the prices of crude oil—at least during most of the 1920's and 1930's. The variations in the demand for petroleum products which accompany changes in business conditions from prosperity to depression and vice versa, are not, in the aggregate, so large as they are for many other industries; and their effect on the prices of petroleum products is in general less severe than is the case for many other industries. Therefore, it seems reasonable that when the fluctuations in crude-oil production are restricted by the widespread application of the optimum-output principle, the changes in demand arising from the ups and downs of business conditions will not be likely to cause extraordinary price variations. That is, over a long period, control of output on the optimum-production basis will reduce the range of fluctuations in crude-oil prices in comparison with the period before proration.

It is not to be thought, however, that the price of crude under conditions of optimum production is likely to follow any steady or easily predictable course. On the assumption that optimum production initially would be below current demand, an approach through the proration procedures to such an optimum rate of output presumably might—if it happened rapidly—occasion a price advance. Then the normal sequence of events would be stimulation to oil-finding activities, increase in the optimum production, and some decline in price. If these developments took place slowly—which is much more probable—they would go hand in hand with relatively little effect on price. Of course, the chance element in the discovery of oil, the effect of changing business conditions at different times, and the uneven progress of various states and various oil fields towards the ideal of optimum production, all might combine at times to make price movements irregular and erratic.

One factor of some importance which would affect the eventual price to consumers under the ideal sort of proration would be the lower cost of getting oil out of the ground by proper well spacing and rational field development. With optimum production, the drilling investment for each barrel of oil would be substantially lower. This reduction in cost would help to stimulate oil-finding activities and help to establish a balance between optimum output and market demand.

There should also be mentioned the probability that a restricted output of crude oil would place a further premium on advances in the technology of refining and would thus insure continued improvement in the quality of products, at the same time stimulating additional investment for modernization purposes. Even if there was a tendency for prices to consumers to advance somewhat, a reasonably steady price based on optimum production might prove cheaper for consumers in the long run than a situation in which low prices during a period of wasteful production were followed by extremely high prices when the scarcity began to pinch. As a matter of fact, it is quite probable that proration has already made the price of gasoline lower than it otherwise would have been, through increasing the yield of crude from the existing oil fields.

A Correct Price Objective for Crude Oil

All these considerations culminate in the question, "What is a correct price for crude oil?" That is to say, "What are the objectives which a price for crude oil ought to seek in order to be considered correct?" In undertaking to answer this question, I start from four facts:

1. The industry is now and for some time past has been producing a supply of petroleum fully adequate to meet the current demand.

2. At the same time, the current rate of production is probably above the optimum rate, although proration procedures are improving.

3. Demand may be expected to grow, though presumably not at so rapid a rate as during the past 14 years.

4. The price of crude petroleum has in general been high enough over the last 14 years to stimulate the exploration necessary to increase the proved reserves from about 5,500,000,000 bbl. to something between 17,000,000,000 and 22,000,000,000 bbl.

Reasoning from these facts, I personally reach the conclusion that the correct price is the price which will keep the following factors at work and

in balance from a public point of view: production, market demand, prevention of waste, rate of discovery, size of proved reserves. In other words, it is a price sufficiently high to bring out a supply adequate to satisfy the growing demand, and at the same time to stimulate the discovery of new fields to a point where the optimum rate of production will balance market demand. That means a price high enough to keep up the process of adding to the proved reserves until they reach a point sufficiently great so that the future may be considered to be adequately safeguarded.

This is exactly what the crude-oil price during the last few years seems to be accomplishing. The rate of increase in reserves since 1924 has been adequate, in spite of the large requirements; on the other hand, it has not been so rapid as to disturb the balance of the industry. That means that on the average the price of crude oil over this period must have been not far from correct. If conceivably the cost of discovering and producing oil should increase during the coming years a higher price for crude might become necessary. On the other hand, if proved reserves should increase steadily in the near future to some such figure as 30 or 35 billion barrels, a somewhat lower price should then serve to maintain the equilibrium.

Of course you understand that the foregoing is my conception of what the general objective of the crude-oil price level should be. It is in no sense a formula for determining a specific price.

Proration and Market Demand

What has been said thus far has been based on the assumption that the proration procedure, from an ideal standpoint, should be directed primarily at achieving the optimum rate of output from each field. In practice, it is obvious that considerations of market demand also weigh heavily with those who direct the proration procedure. The Bureau of Mines provides estimates of demand by states. The initial consumers of crude oil in filing nominations for allowables transmit to the authorities their estimates of the quantities that their markets will absorb. In both these processes, it may well be argued, there is the implicit assumption that the size of the market demand is that which exists at current prices.

The fact of the matter is that it is not at the present time practicable to separate rigidly the concepts of optimum production and market demand. If petroleum is produced in quantities greater than those demanded, with the result that aboveground storage must be provided, waste occurs, not merely deterioration of products in storage, but the waste of capital involved in providing storage capacity beyond current operating requirements. Overproduction of crude oil in relation to demand consequently has been held by the courts to be a waste which proration officials have the responsibility for preventing. Hence, consideration of market demand must continue to receive attention.

There has been criticism of the attention which the proration authorities give to market demand. Some of this criticism in particular instances may be justified. Instead of applying the market-demand concept to a whole state, the authorities may try to apply it to individual fields. This causes difficulty because it complicates the problems of equity. Problems of equity arise (1) among different producers in the same field and (2) among different fields in the same regulatory jurisdiction. The basic problems of equity are independent of market demand. In a single field, for instance, if there are many surface owners, with differently situated holdings, it is by no means simple to take oil out of the ground in such a way as to treat them all with justice, that is, to preserve an equitable relationship between underground reserves and surface holdings. Such problems are made inevitable by the nature of the commodity, the conditions of its production, and of course by the rule of capture. Bringing consideration of market demand for an individual field into the proration procedure complicates the problems of doing equity, especially between fields. In such a situation it is obvious that pressure will be exerted on the proration authorities, that special favors will be requested (and sometimes granted), and that complaints of injustice will be common.

Meeting the Problems

There are no easy answers to these problems. In any situation involving so many different people and interests, the attainment of complete equity is an impossible ideal under any set of industry or governmental policies. Critics of the regulatory bodies must remember that appreciation of the need for conservation has been a slow growth in the minds both of men in the industry, and of the general public, and that general acceptance of this conservation principle has by no means been either simultaneous or universal.

But there are some directions in which substantial improvement might be made. For one thing, more attention must be given to the proper spacing of wells to get optimum production in each field with minimum drilling expenditure. At the same time, it is also important to insist on higher standards of administrative procedure on the part of the regulatory commissions in order to stamp out the pernicious practice of granting special favors and exceptions.

In general, state conservation and proration is a sound concept. Improvement in administration is possible. Elevation of purpose, clarification of objectives, and strengthening of personnel, standards and procedure are all vitally necessary. Although there are valid grounds for criticizing many of the actions of the state commissions, I want to emphasize the fact that notable progress towards conservation has been made under this system. I am confident that this progress will continue.

There is another aspect of the problem which ought to be looked at, and that is the matter of price. There is some reason to believe that in situations such as that which developed in 1938 and the first half of 1939, oil companies have perhaps refrained too much from the use of price as a means of adjusting supply and demand. Comment has already been offered on the way in which crude prices are made. I am here expressing simply my own personal opinion to the effect that there ought to be more responsiveness in the posted price of crude to such changes in basic conditions as became evident in this recent period. It is recognized that the disastrously low crude prices, resulting from the flood of overproduction which happened to coincide with the bottom years of the depression, naturally resulted in an overemphasis on price stability when corrective mechanisms were first established. But it now seems wise to move in the direction of exercising partial control over supply through a more realistic price policy. The proration approach to the problem aiming at the concept of optimum output is vital; but at the same time I believe it will be useful to the industry to make some approach to the problem from the other end, namely, by the method of price.

The practical situation is that the petroleum industry is in a period of transition and that, despite serious doubts as to the value of some of the things done in the name of proration, it does no good to look for short roads to perfection. The better approach to the problems of the oil industry is to seek improvement of the existing proration procedure and mechanisms and the existing standards of performance and equity, and for all parties concerned to seek a better understanding of the whole problem along broad lines of industrial statesmanship in contrast with narrow lines of temporary, sectional, or merely selfish interest. Progress in this better approach will have to be made by seeking out and taking the next logical steps, rather than by trying to reform the whole procedure from some new angles. Such "next logical steps' might reasonably include the following:

1. More attention to the development and enforcement of suitable drilling patterns for each field.

2. More attention to the determination of allowables based on the optimum rate of production for the field, with necessary consideration to the oil in place rather than to the individual wells.

3. More attention to the determination of supply for a state on the basis of the optimum production of that state as established by the aggregate optimum production of the individual fields.

4. Continued efforts on the part of the oil compact states to get other oil-producing states into the compact group, and to improve their own conservation laws.

5. Further development on the part of the compact states of common standards of production efficiency that will bring a closer approach to optimum production.

6. Development at the same time on the part of these states of better standards to assure equity as between owners of property in the same oil field and as between different oil fields.

Progress Can Be Made

If both the oil industry and the proration authorities will move in the general direction which these suggestions indicate, and if at the same time the oil companies will adjust their posted crude prices more rapidly to such changes in basic conditions as we have seen periodically in recent years, substantial progress will be made toward smoothing out the present difficulties which stand in the way of effective proration and toward preventing the recurrence of periods when large volumes of crude are being sold at prices below the posted prices for similar gravity being paid for the greater part of the daily crude production.

Just one word in closing: I do not want to claim for one second that proration is against the interest of the large oil companies. It is in their interest; but it is also in the interest of the citizens of the producing areas, in the interest of the state and local governments in those areas, and in the interest of the consuming public. It is also most emphatically in the interest of national defense. Furthermore, as regards my own company, the Standard Oil Company (New Jersey) is a big company in the oil industry, and I have not the slightest hesitation in saying that we are in business to make a profit. But we are in business not merely today and tomorrow, but for a long time to come, and we want to make profits not merely today and tomorrow, but also for a long time to come. Therefore, we can and do look at our problems with a long-run perspective; and in the long run we know that for a company as big as ours its welfare, that is, the welfare of its stockholders and its employes, is unavoidably bound up with the welfare of the country as a whole. When the big oil companies accepted the idea of proration they voluntarily submitted to restraints which they frequently did not like, restraints which made them forego many opportunities for immediate profits, restraints which were directly contrary to their ingrained habits of thought. But they did it because they figured that in the long run these restraints were going to be good for them. They sacrificed immediate profits in order to gain greater assurance of stability for the future. In the light of all the circumstances, I think it is not an overstatement to say that the present proration program sponsored by the oil industry, imperfect though it may be in many respects, represents an important act of real industrial statesmanship.

ILLINOIS GEOLOGY

(Continued from Page 35)

the state. This is the most prominent structural trend in the state and the old fields were found on it, but here the most important movements were post-Chester and pre-Pennsylvanian in age. Consequently, much of the oil was found in Pennsylvanian sands and where it was found in older sands it occurred where older trends crossed the La Salle anticline and gave rise to crossfolds in which the oil accumulated.

In fact, in the fields of Clark County, the north-south Oakland anticline was of much greater importance in localizing the oil than the La Salle anticline itself.

On the Centralia-Colmar trend there are five fields—Ina, Sandoval, Sorento, Jacksonville, and Colmar-Plymouth. With the exception of Ina, all these produce from the Devonian. The Decatur and Lawrence County fields lie on a parallel trend, Collinsville and Pike County on a third.

This alignment indicates that the earliest structural pattern in Illinois was a series of parallel northwest-southeast folds. Whether these belts were uplifted or the rest of the basin sank, reference to them is only of theoretical importance. The important fact is that these zones, together with one from Louden into Wabash County, form the basic pattern of Illinois production.

At a later time north-south trends appeared, and at almost the same time northeast-southwest trends. These trends are indicated by structure maps of the individual fields as well as by such strongly marked surface features as the DuQuoin and Oakland anticlines. They are generally of shorter length than the older folds and accumulations of McClosky and Chester oil are found mainly where they intersect the older northwest-southeast trends. This is plainly shown in Fig. 2.

The anticlinal trends shown on this map are broad features and fields are located on them either by crossfolding or by reason of the development of porosity locally. Important fields tend to be concentrated at or near the intersection of two trends as in the Louden, Salem-Centralia, Clay City and Griffin areas.

New Fields and Extensions of Trends

Ina-Staunton.—The parallelism of a line joining the Staunton and Carlyle fields with the main Centralia-Colmar trend was established as a definite trend by the discovery of five fields in Jefferson and Franklin counties where this line was intersected by the southward extension of the north-south trends in the Centralia-Salem area.

Cordes-Ayers.—The southward extension of the Ayers-Carlyle line to the Cordes field also establishes another field on what seems to be another northwest-southeast line passing through the Collinsville and Pike County areas. If this is established as a definite trend, an accumulation of oil may be expected in the southwest of Franklin County.

Centralia-Colmar.—Developments along this main line of folding have not uncovered any new areas of importance and no significant crossfolds are indicated by recent developments.

Griffin-Louden.—Groups of fields in the Louden, Clay City and Griffin areas are establishing this important northwest-southeast zone with an interesting discovery in the Aux Vases at Iola. This discovery together with Cordes and the Centralia-Salem area make the extension of trends into northwestern Jasper County a likely possibility. There appear to be good possibilities also of an intersection of trends a few miles northeast of Tonti.

Clay City area.—In addition to the lines shown on the map, there appears to be a belt of northeast-southwest folding extending into White County. The 1939 discoveries in this area tend to confirm the complicated structure pattern and also indicate the possibilities of additional fields on some of the undrilled intersections.

Storms-Allendale and Junction-Union.—The discovery of several fields along the Storms-Allendale trend is one of the most significant developments of the past year. The Storms field in particular may be the first indication of a group of local oil-bearing structures in the Hamilton, White, Saline and Gallatin County area where the Clay City structures intersect this trend.

Still farther south, the Junction pool in Gallatin County links up with the Princeton and Union pools in Indiana, increasing the interest with which Posey County will be watched.

Summing up, it may be said that the drilling of the past year throws certain areas into sharp relief. These are southwestern Franklin County, northwestern Jasper County, the area southwest of the Storms pool and Posey County, Indiana. If the next year follows the same general pattern as last year, there should be a number of fields located in these areas.

The rim of the basin continues to invite development without much success. Although Coles and Shelby counties have been added to the list of producers, there has not been much promise of important production in these counties.

A Hoing-sand producer was found in Hancock County near the Colmar-Plymouth field, but its initial production was only 3 bbl.—a result which does not warrant much further development here.

The counties having the greatest number of dry holes without a commercial producer are located around the rim of the basin and show excellent surface structures. Of these there may be mentioned Bond County with 15 dry holes in 20 months, Effingham with 13, Jasper with 10, Macoupin with 11, and Montgomery with 14. Most of these were drilled on coal structures which faded out, as have others in the basin. It must be remembered, however, that Bartelso and other fields were located on structures of the same type.

Mississippi lime, Niagaran and Trenton production continues to be listed among the important possibilities. With the main emphasis on the McClosky and Chester and with new producing horizons being found in the Chester, it does not appear that these older horizons will be tested fully in the near future. As it is, they produce more than their share of disappointments.

The Devonian pay of Sandoval caused a flurry of excitement for a time but the production falls off rapidly and water encroachment is great so that interest in this pay has waned.

Added to the poor record of lower pays is the fact that little is known of the structural conditions governing oil accumulation. Dupo and Waterloo were on sharp Ordovician structures and others may exist, but it is not known that these deep-seated structures are reflected in higher formations. Although the northwest-southeast trends appear to have influenced Devonian accumulation, it is quite probable that the cross trends came too late to govern oil accumulation in the lower pays at intersections. Certainly the scattered showings in Fig. 1 do not lend themselves to alignment along north-south or northeast-southwest trends as do the later fields.

It appears at this writing as if there was as yet no basis for systematic prospecting of the deeper pays and any important discoveries will be more or less a matter of good fortune.

Summary

Recent developments in Illinois show a rapid development of regional trends with the discovery of important fields at or near their intersections. The important producing horizons continue to be McClosky and Chester, with new pay formations in the latter. Present indications of future development are that these trends will be extended mainly to the south and there are better possibilities in the counties immediately south of the present producing area than elsewhere in the basin. There are as yet few concrete indications of important pre-McClosky production.

APPROXIMATE DEPTHS TO PRINCIPAL PRODUCING HORIZONS IN ILLINOIS OIL FIELDS* (Courtesy A.A.P.G. Bulletin)

Geologic system or formation		Colmar-Plymouth	Dupo	Carlyle-Bartelso	Centralia	Lake Centralia - Salem	Dix	Patoka	St. James	Beecher City - Louden	Central Basin Area	Southeastern Illinois
PENNSYLVANIAN	Pottsville											Robinson and Bridgeport sands 1000' Buchanan - 1250'
MISSISSIPPIAN	Chester — Cypress			Carlyle sand 1000'	Cypress 1200'				Weiler 1600'	Weiler sand 1510'	Weiler sand 2600'	Kirkwood sand 1500'
	Chester — Bethel				Benoist 1350'	Benoist 1770'	Benoist 1950'	Benoist 1420'		Benoist 1540'		Tracy sand 1600'
	Chester — Aux Vases					Aux Vases 1800'					Bradley sand 2990'	
	Ste. Genevieve — Fredonia					McClosky "sand" 2000'					McClosky sand: Clay City 2980'; Noble 2960'; Olney 3050'; Schnell 3010'; Flora 2970'; Ciene 3120'; Aden 3290'; N. Aden 3310'; Leech Twp. 3450'	McClosky "sand" 1700'
DEVONIAN		Hoing sand 450'										Martinsville pool "Niagaran" 1550'
ORDOVICIAN			"Trenton" 500'									Westfield pool "Trenton" 2260'

* Several fields, having only one to four wells each, are not included.

Refinery Expansion

Bell Contracts for Output Of Glenco Refinery

Bell Oil & Gas Co., Tulsa, has contracted to market the output of Glenco refinery at Bloomingdale, Mich. This plant is centrally located to serve both the truck and tank-car trade in Michigan, Indiana, northern Illinois and Wisconsin. Glen Caldwell, president of the company, operates the refinery. The capacity is about 2,000 bbl. daily; at present it is running about 1,200 bbl. Two grades of gasoline are made, a high test and a regular. Other products are kerosene, domestic gas oil and railroad fuel oil.

Hal Coleman, of the Bell organization, is stationed at the plant in Bloomingdale handling the local sales.

The plant will shortly complete improvements which will permit making technical naphthas; plans are being drawn up for an ethyl plant for the purpose of making Bell Ethyl Gasoline.

Bell products are now sold in 21 states. Shipments from the Mid-Continent field are made as far west as Salt Lake City, Utah. Bell operates truck-loading facilities at Grandfield, and Ardmore, Okla., Willow Springs, Tex., as well as at Bellitex, a new town located west of Burkburnett, Tex., where the terminal of the company gasoline pipe line from Grandfield, Okla., is located.

The company is completing extensive improvements, including a new cracking unit and poly unit at the Ben Franklin refinery at Ardmore.

W.P.R.A. Announces Program Of Shreveport, La., Meeting

The manufacturing committee of the Western Petroleum Refiners Association and officials of the association in Tulsa have arranged a series of regional technical meetings, in accordance with practice followed in the past few years. The second meeting in the 1939 series will be held in Shreveport, La., Friday, October 27, at the Washington-Youree Hotel. The first meeting of the series was held recently at Wichita, Kans.

The program for the Shreveport regional meeting comprises three highly important technical papers, and an actual demonstration of tube rolling. Starting time will be 9:30 a.m. The program is as follows:

"Inhibitors for Cracked and Polymerized Gasoline," by W. W. Scheumann, Cities Service Oil Co.

"Combination Reforming and Polymerization," by Dr. M. B. Cooke, Alco Co.

"Treating in Transit," by R. P. Lowe, Proportioneers, Inc.

There will be a demonstration of tube rolling at Arkansas Fuel Oil Co.'s Bossier City refinery by Key Co. of East St. Louis, Ill.

Antarctic Snow Cruiser Receives Special Fuel

WHITING, Ind., Oct. 21.—Thirty-five thousand gallons of special gasoline and lubricant were shipped today in barrels from the local refinery of the Standard Oil Co. (Indiana) to Boston, Mass., where it will be taken by boat to the South Pole base from which the snow cruiser will operate. The snow cruiser has been given considerable publicity because of its unusual design. It is practically a combination of a tractor, transcontinental bus and railway car. It is 55 ft. long, 20 ft. wide and 12 ft. high. It weighs 20 tons empty and 37 tons when loaded with supplies, equipment and personnel.

Gulf Coast Refiners Report On Stocks October 25

HOUSTON, Tex., Oct. 25.—Figures released by the Gulf Coast Refiners Association October 25 showed a total of 811,864 bbl. of unsold stocks of motor fuel in the hands of 10 member companies, an increase of 103,855 bbl. over a week ago, although most of these stocks are in the hands of three companies expecting to load boats this week. Several companies reported no unsold stocks.

Unsold aviation-gasoline stocks totaled 154,730 bbl., compared to 146,070 bbl. last week; naphtha, 101,753 bbl., an increase of 9,689 bbl.; and Bunker C fuel, 21,658 bbl., an increase of 2,729 bbl. No companies have unsold gasoline, having disposed of the 57,656 bbl. held last week. One company reported oversold and trying to buy on the outside. Gas oil unsold totaled only 10,000 bbl., a decrease of 2,536 bbl. There is no gas oil or No. 5 fuel on hand. Of the naphtha, 70,230 bbl. comprises high blending stock. Members of the association cut crude runs during the week to 576,832 bbl., compared with 675,535 bbl. the preceding week. Runs represented 64.3 per cent of capacity.

Three exchanger-type reactors filled with catalyst operating in series at the Gulf Oil Corp. refinery at Port Arthur, Tex. The polymers and unchanged butanes pass from these to the fractionating equipment

Natural Gas

Lethbridge Gas Franchise

LETHBRIDGE, Alta.—The Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary is asking a special franchise for a 20-year term from the city of Lethbridge. The company's former franchise lapsed in 1927, and it has been operating since without renewal.

President Endorses California Oil Conservation Bill

WASHINGTON, D. C., Oct. 24.—President Roosevelt today endorsed the Atkinson conservation bill in California. He said failure of the compact method would lead to federal control.

Three New Producers In Mississippi Field

JACKSON, Miss., Oct. 23.—All doubt as to the importance of Mississippi's first oil field was removed as three new wells in the recently opened Tinsley field in Yazoo County showed substantial production. One started off at 396 bbl. per day, through choke; a second was cleaning itself, flowing from 8 to 10 bbl. per hour, choked down, and a third was showing excellent signs of production from Eutaw sand, but was coring deeper. A new operation is being rigged up, and several locations made close to the producers.

Union Producing Co.'s No. 1 Jennie Stevens, C NW NW Section 13-10-3w, which missed the sand of the discovery well, drilled to the Eutaw sand and at a total depth of 4,877 ft. made a very promising showing in a drill-stem test. Oil filled 2,900 ft. of drill pipe in 11 minutes from sand topped at 4,860 ft. The company ordered coring continued, and Blue shale was being cored at 4,897 ft.

Union Producing Co.'s No. 1 Perry, C NW NW Section 24-10-3w, south of the discovery, flowed 396 bbl. in 24 hours through ¼-in. choke from Selma chalk, the pay in the discovery well.

The field was opened late in August by Union Producing Co.'s No. 1 Woodruff, C NW SW Section 13-10-3w, which flowed 93 bbl. in 12 hours from Selma chalk at a total depth of 4,560 ft. It produced an average of 330 bbl. per day of 32-gravity oil through 12/64-in. choke last week.

Jones & O'Brien's No. 1 Jennie Stevens, near C SW NE Section 13-10-3w, was cleaning into pits through 19/64-in. choke, making 8 to 10 bbl. per hour from Selma chalk at 4,488-4,519 ft.

Yazoo Refinery, Inc.'s No. 1 Brooks, C W½ SE NW Section 13-10-3w, was being rigged up. New locations include Union Producing Co.'s No. 1 Carson, C NW NW Section 25-10-3w; No. 1 Claiborne, C NW NE Section 22-10-3w; No. 1 Friely, C NW SE Section 14-10-3w, and O'Brien Brothers' No. 2 Stevens, C SE NE Section 13-10-3w.

Corpus Christi Purchase Involves $1,975,000

CORPUS CHRISTI, Tex.—Southern Minerals Corp. of Corpus Christi has acquired Corgey & Grote holdings in the McCampbell field in San Patricio and Aransas counties, which involves the purchase of 40 producing wells, two drilling wells and 918 acres.

Naston Nixon, vice president of Southern Minerals, said the consideration was $1,175,000 cash and $800,000 out of oil. The wells are producing from the regular 7,100-ft. sand in the south extension.

Petroleum Safety Section Reports Less Injuries

ATLANTIC CITY, N. J., Oct. 23.—Injury records of 210,000 oil-company employes from July 1, 1938, to June 30, 1939, compiled for the petroleum section contest of the National Safety Council, revealed a 34 per cent decline in the frequency of oil-industry injuries compared with the preceding contest, H. N. Blakeslee, director of the American Petroleum Institute Department of Accident Prevention, declared before the petroleum section, during the National Safety Congress, here. The 1938-39 record showed a frequency of 9.26 injuries per million hours worked, against 14.09 in the 1937 contest.

An important result of a complete safety program has been discovered in its accomplishments in training operating supervisors, not merely in safety, but in more efficient methods of doing routine work.

Pipe-Line Activity

Laying 22-in. gas line from Grapevine to Newhall, California, which breaks up into feeds for Los Angeles

Cunningham-Hutchinson Gas Line Completed

An 8-in. gas pipe line from the Cunningham field in Kingman and Pratt counties, Kansas, to Hutchinson, Kans., was completed by Cities Service Oil Co. last week and the first gas was run through the line October 27. It connects at Hutchinson with Cities Service main line from western Kansas to eastern Kansas and Missouri. The new line is about 35 miles long. Other buyers of gas in the Cunningham area are Kansas Power & Light Co. and Drillers Gas Co.

Valley Pipe Line Plans Starr County Extensions

HOUSTON, Tex.—Extension to the Valley Pipe Line Co. crude-oil gathering system in the Rio Grande Valley district was announced last week by Frank T. Murchison, president of the company. One 25-mile extension will connect with the Las Cuevitas field, northwestern Starr County. The other extensions will tie in with the Rincon and Sun fields, northeastern Starr County, and with the Alta Mesa field in Brooks County. The company's main line at the present extends from the El Tanque field in southern Starr County to Port Isabel in Cameron County.

Survey for 265 Miles From Cut Bank to Spokane

DENVER, Colo., Oct. 23.—Another pipe-line outlet for Cut Bank crude and for other northern Montana fields appears in the offing, according to D. F. Gerstenberger, general manager of Inland Empire Refineries, Inc., which operates a refinery at Spokane, Wash., on Montana crude. He says surveys have been started to determine its feasibility. The projected line will consist of 6-in. pipe from Cut Bank to Spokane, a distance of 265 miles. The route is a difficult one, involving laying of a line over the Continental Divide, but pipe-line authorities express opinion it is feasible if a market for 6,000 bbl. of crude per day can be assured.

The undertaking will arise out of a situation very much like that which caused Utah Oil Refining Co. to begin the construction of its line from Lance Creek, Wyo., to Salt Lake City, now nearing completion. Pacific Coast interests have been fortifying themselves in eastern Oregon, Washington and northern Idaho by moving in products by the Columbia River and trucks. Recent decisions in several important cases by the Interstate Commerce Commission resulted in the equalizing of rail rates from Montana and Pacific Coast points, in both directions, on crude and petroleum products, but this does not entirely relieve the situation, because the Pacific Coast interests still are in a position to move products by barge up the Columbia River to Umatilla and then in privately owned trucks to Spokane, and offset the higher rail rates. The Montana-Spokane interests look upon the construction of the pipe line as the only alternative to the loss of extensive markets.

Cardinal Completes Outlet To White & Baker Field

SAN ANGELO, Tex.—Cardinal Oil Co., San Angelo, has completed laying of a 2-in. pipe line from the White & Baker field in Pecos County to Shell Pipe Line Co.'s pump station in the Yates field 10 miles to the northeast. The carrier will have a daily capacity of 1,000 bbl. Previously, oil was trucked from the field to the Taylor-Link field, 16 miles to the west. Cardinal drilled the discovery well in the field in April 1938 and owns all producers in it—six oil wells and several gas producers.

Magnolia to Let Contract For Gasoline Line

HOUSTON, Tex., Oct. 23.—Magnolia Petroleum Co. will let contract this week for a combination 4½ and 5-in. welded gasoline line from Corpus Christi to San Antonio. The company will barge gasoline from its refinery at Beaumont via the Intercoastal Canal to Corpus Christi, where storage facilities will be constructed.

J. R. Murphy Advanced

J. R. Murphy, of Tulsa, has been advanced to general superintendent of Gulf Refining Co.'s pipe-line division in Oklahoma to succeed the late James N. Hunter. Mr. Murphy was assistant general superintendent.

Natural Gasoline

Propose Building Recycling Plant in the La Rosa Field

HOUSTON, Tex.—The Coronado Corp. received permit from the Texas Railroad Commission for the construction of a recycling plant in the La Rosa field, Refugio County, Texas. While details of the plant have not been announced, it is expected to be of the high-pressure type and will have a daily capacity of 50,000,000 cu. ft. of gas per day. The plant will be located on the B. D. Rooke lease. Production in the field is from several sands between 5,500-6,300 ft.

California Natural Gasoline Association Program

LOS ANGELES, Calif.—Plans for the California Natural Gasoline Association's fourteenth annual fall all-day meeting at the Ambassador Hotel, Los Angeles, have been completed according to the joint announcement of P. S. Magruder, president; W. C. Dayhuff, program chairman, and Harry Fiske, chairman of the entertainment committee.

The first of the day's papers will be "Advances in Analytical Fractionation Technique," by W. J. Podbielniak, consulting engineer of Chicago.

"Natural Gas Conservation and Utilization in California" is the final morning paper, delivered by Roy M. Bauer of the Southern California Gas Co. who poses such problems as "What is the present day status of gas conservation? What are the possibilities of underground storage? What are the reasons for variations in requirements, particularly of gas companies, between the different seasons?"

A paper on "Alkylation," has been prepared by E. W. Gard, A. L. Blount, and Dr. K. Korpi, all of the Union Oil Co. of California. Alkylation is of interest to the natural-gasoline industry because isobutane is reacted with isobutylene obtained in the refinery. The natural-gasoline manufacturer is interested in the overall effect which the use of these hydrocarbons will have. This paper will explain what isooctane is, the different methods of its preparation and to what use the finished product is put in building up premimum aviation fuel.

"The Role of Natural Gasoline Plant Products in Motor Fuels of the Future," is the subject of the second afternoon paper, by C. C. Moore, of Union Oil Co. of California.

Dr. Podbielniak returns to the platform with "The Centrifugal Super-Contactor" as his subject. He will stress the fact that a small unit occupying no more space than a 5-hp. motor has the fractionating efficiency of a 100-plate column and that units of any size and capacity can be operated to suit almost any fractionating column.

Construction to Start Soon On Cayuga Recycling Plant

DALLAS, Tex.—Construction work on the second gas-recycling plant of Tide Water Associated Oil Co. and Seaboard Oil Corp. in the Cayuga field of Anderson and Henderson counties, Texas, will be commenced about November 1, company officials announced last week. The partnership's newest plant, in the Long Lake field of Anderson County, is virtually completed, but operations are not expected to be started for about 1 month. The plant has been doubled in capacity from the original planned capacity of 10,000,000 cu. ft.

PROGRAMS AND MEETINGS

S.A.E. Fuels and Lubricant Program for Tulsa

A program of unusual interest and timeliness has been prepared by the Society of Automotive Engineers for presentation at the Mayo Hotel in Tulsa November 2 and 3 before the National Fuels and Lubricants Division. Aviation authorities will discuss modern aviation fuels as one feature of the meeting. Refiners and research men will be especially interested. The program follows:

Thursday, November 2, 10 a.m.—Ralph R. Matthews, chairman. Vapor Characteristics of Current Winter Motor Fuels by R. C. Alden, H. M. Trimble and M. G. Blair, Phillips Petroleum Co. Hypoid Lubricants by C. F. Prutton and A. O. Willey, consultants, Lubri-Zol Corp.

2 p.m.—Arthur L. Heintze, chairman. Observations on Tractor Fuels—Characteristics and Requirements by E. L. Barger, associate professor of agricultural engineering, Kansas State College. Automotive Maintenance Cleaning Operations by H. Liggett Gray, Oakite Products, Inc.

6:30 p.m.—Dinner. B. E. Sibley, chairman. Too Old to Learn? by C. B. Veal, research manager, S.A.E. Aviation: "The Present Trend in Design and Size of Military Equipment," by Barton K. Yount, assistant chief, Air Corps, U. S. Army Air Corps.

Friday, November 3, 10 a.m.—G. C. Richardson, chairman. The Multi-Fuel Engine, a New Internal-Combustion Engine That Can Follow the Fuel Trends by P. C. Ritchie, Waukesha Motor Co. Power Applications for Movement of Earth by J. M. Davies, Caterpillar Tractor Co.

2 p.m.—Earl W. Pughe, chairman. Metal-Cutting Tests Using Butane, Propane and Acetylene by W. T. Tiffin and Ottie Eads, University of Oklahoma. Military Automotive Equipment, A. W. S. Herrington, Marmon-Herrington Co., Inc.

6:30 p.m.—Dinner. Frank A. Suess, chairman. Resolved That V-Type Engines Are to Be Preferred to In-Line Engines for Passenger Car Equipment. Affirmative, Kansas State College, department of mechanical engineering. Negative, University of Oklahoma, school of engineering, S.A.E., student section.

Exposition Hall of Science To Be Permanent Exhibit

At the recent meeting of the scientific and technical committee of the International Petroleum Exposition, to be held May 18 to 25, 1940, in Tulsa, plans were laid for a permanent exhibit for the Hall of Science which would be open to sightseers at all times and which would be changed from time to time as new devices and methods are developed.

Dr. C. K. Francis, technical editor of The Oil and Gas Journal and cochairman of the committee, is now in California making arrangements for special exhibits.

The committee will attempt to incorporate exhibits which will do a public-relations job for the oil industry (following the suggestion of W. G. Skelly, president, and William B. Way, general manager of the exposition), working with the Independent Petroleum Association of America and the American Petroleum Institute.

At the same committee meeting, presided over by Dr. Egloff, reports were made on efforts to secure exhibits for the Hall of Science: the manufacturing of synthetic rubber from petroleum; carbon black; latest developments in natural gasoline production, etc.

Committee members include: E. R. Baker, Shell Oil Co., Inc.; John W. Bates, Reading & Bates; Al Beekly, Mid-Continent Petroleum Corp.; T. E. Birmingham, Margay Oil Corp.; Dr. E. Bloesch, geologist; Henry Boggess, Sinclair Oil Co.; J. A. Bush, Sinclair Prairie Oil Co., all of Tulsa; A. C. Carlton, Museum of Science and Industry, Chicago; R. A. Cattell, Department of Interior Petroleum and Natural Gas Division; Frank R. Clark, Ohio Oil Co.; John Day, Western Petroleum Refiners Association, both of Tulsa; J. G. Detwiler, Texas Co., New York; Dr. Gustav Egloff, Universal Oil Products Co., Chicago; Dr. Charles K. Francis, The Oil and Gas Journal, Tulsa; R. A. Halloran, Standard Oil Co., San Francisco, Calif.; Don R. Hinderliter, Hinderliter Tool Co.; F. E. Holsten, chemist; J. P. D. Hull, American Association of Petroleum Geologists; D. K. Hutchcraft or George W. Probst, Clark Engineering Co., all of Tulsa; J. V. Jirasek, Sharples Solvents Corp., Philadelphia, Pa.; A. J. Kerr, Pittsburgh Equitable Meter Co.; Kent K. Kimball, geologist; Dr. R. S. Knappen, Gulf Oil Corp.; Dean R. L. Langenheim, University of Tulsa; Paul F. Lewis, American Glycerin Co.; Frank B. Long, Oklahoma Natural Gas Co.; William F. Lowe, Natural Gas Association of America, all of Tulsa; P. E. McKinney, Bethlehem Steel Co., Bethlehem, Pa.; Clarel Mapes, Mid-Continent Oil and Gas Association; F. L. Martin, Sunray Oil Co., both of Tulsa; Ralph Mathews, Battenfield Grease & Oil Corp., Kansas City, Mo.; Dr. T. Midgley, Jr., Ethyl Gasoline Corp., Worthington, Ohio; Walter Miller, Continental Oil Co., Ponca City, Okla.; C. V. Millikan, Amerada Petroleum Corp., Tulsa; P. A. Mills, Pittsburgh, Pa.; J. C. Morrell, Universal Oil Products Co., Chicago; G. G. Oberfell, Phillips Petroleum Co., Bartlesville; Stafford Park, Oklahoma City; C. P. Parsons, Halliburton Oil Well Cementing Co., Duncan, Okla.; William Plumber, Standard Oil Co. (Indiana), Chicago; H. R. Powers, Bethlehem-International Supply Co.; Paul M. Raigorodsky, petroleum engineer, both of Tulsa; Dr. C. W. Ripple, Solvay Sales Corp., New York; John E. Roth, Tide Water Associated Oil Co.; J. H. Satterwhite, Westcott & Greis; W. W. Scheuman, Cities Service Oil Co.; W. A. Schlueter, president, Refinery Supply Co.; L. W. Shank, Ethyl Gasoline Corp.; R. D. Shaw, Dowell, Inc.; D. A. Sikes, Baroid Sales Co., all of Tulsa; N. A. C. Smith, Bureau of Mines, Bartlesville, Okla.; H. M. Stalcup, Skelly Oil Co.; H. G. Texter, Spang Chalfant, Inc., both of Tulsa; C. A. Thomas, Monsanto Chemical Co., Dayton, Ohio; E. H. Triphause, Taylor Instrument Co.; Arthur F. Truex, Sun Oil Co., both of Tulsa; Cary Wagner, Pure Oil Co., Chicago; Theron Wasson, Pure Oil Co., Chicago; M. F. Waters, Hanlon-Waters, Inc.; Dr. B. B. Weatherby, Seismograph Service Corp.; Dr. G. H. Westby, geologist, all of Tulsa; T. R. Weymouth, Columbus Gas & Electric Corp., New York; W. K. Whiteford, British American Oil Producing Co., Tulsa; Dr. E. C. Williams, Shell Development Co., Emeryville, Calif.; Robert H. Wood, geologist, Tulsa; C. E. Wright, British American Oil Producing Co., Tulsa.

Ark-La-Tex A.P.I. Chapter Meeting at Shreveport

The Ark-La-Tex A.P.I. chapter will hold its first dinner meeting for the fall at 7 p.m., October 31, in the Washington-Youree Hotel, Shreveport. The subjects discussed will concern recycling. Stuart E. Buckley, Humble Oil & Refining Co., Houston, will present a paper on "Gas-Distillate Reserves" and W. E. Schoeneck, Ohio Oil Co., Shreveport, will speak on "Experimental Recycling at Cotton Valley."

CALENDAR OF EVENTS

October

WESTERN PETROLEUM REFINERS ASSOCIATION, regional technical meeting, Washington-Youree Hotel, Shreveport, La., October 27.

November

SOCIETY OF AUTOMOTIVE ENGINEERS, fuels and lubricants meeting, Mayo Hotel, Tulsa, November 2-3.

AMERICAN PETROLEUM INSTITUTE, Division of Production, Illinois basin chapter, Masonic Temple, Salem, Ill., November 3.

NATIONAL MOTOR TRUCK SHOW, Navy pier, Chicago, November 8-16.

GAS-LIFT CONFERENCE, at Texas A. & M. College, College Station, addressed by S. F. Shaw, November 9-11.

AMERICAN PETROLEUM INSTITUTE, twentieth annual meeting, Stevens Hotel, Chicago, November 13-17.

TWENTY-FIVE-YEAR CLUB OF PETROLEUM INDUSTRY, first annual meeting and dinner, Stevens Hotel, Chicago, November 14.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, Providence, R. I., November 15-17.

CALIFORNIA NATURAL GASOLINE ASSOCIATION, annual fall meeting, Los Angeles, Calif., November 17.

December

WEST CENTRAL TEXAS OIL AND GAS ASSOCIATION, Abilene, Tex., December.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Philadelphia, Pa., December 4-7.

PETROLEUM ELECTRIC POWER ASSOCIATION, eleventh annual conference, Texas State Hotel, Houston, Tex., December 14-15.

January 1940

SOCIETY OF AUTOMOTIVE ENGINEERS, annual meeting, Book-Cadillac Hotel, Detroit, Mich., January 15-19.

February

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, New York, February 12-15.

April

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-fifth annual meeting, Stevens Hotel, Chicago, April 10-12.

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, Columbus, Ohio., April 11-12.

NATIONAL PETROLEUM ASSOCIATION, semi-annual meeting, Cleveland Hotel, Cleveland, Ohio, April 18-19.

May

NATURAL GASOLINE ASSOCIATION OF AMERICA, annual convention, Hotel Tulsa, Tulsa, May 15-17.

INTERNATIONAL PETROLEUM EXPOSITION, Tulsa, May 18-25.

ILLINOIS BASIN

. . . A SPECIAL SECTION OF THE OIL AND GAS JOURNAL

Devoted to a description of the most active oil area in the United States, and fourth largest in total production

In This Section

PERSONALITIES IN THE ILLINOIS BASIN

BASIN SHOWS INCREASE IN ALL DEPARTMENTS

MAJOR CHANGES REFLECTED IN ILLINOIS REFINING OPERATIONS

SIX HORIZONS PRODUCING IN WABASH VALLEY

DRILLING EQUIPMENT ACCOUNTS FOR ILLINOIS COMPLETION RATE

VOLUNTARY CONSERVATION RESULTS IN INCREASED RECOVERY

ILLINOIS DEVELOPS OWN PRODUCING PRACTICES

REFINING CHARACTERISTICS OF NEW ILLINOIS BASIN CRUDE OILS

ILLINOIS PRODUCTION FORCES INCREASED PIPELINE OUTLETS

RESERVES OF ILLINOIS EXCEED 500,000,000 BARRELS

SERVICE ON NEW FIELDS

LUBRITE HOUDRY UNIT TO PROCESS ILLINOIS OIL

OPERATING IDEAS GLEANED IN ILLINOIS FIELDS

OCTOBER 26, 1939

Personalities in the Illinois Basin . . .

Informal snapshots by the Journal's representative

(1) Lee Vaughan, Williams Brothers Pipe Line Co., and Kenneth Cramer, inspector of construction, Sohio Corp. (2) Bus Harper, assistant superintendent in charge of drilling and development, and Frank Bruner, district superintendent, St. Elmo district, Carter Oil Co. (3) Charlie Barker, tool pusher, Pugh Drilling Co.

(4) Fred Fielder, drilling contractor, and Jim Frayne, production superintendent, T. T. Word Oil Co. (5) J. T. King, president, and Ace Lee, production superintendent, Kingwood Oil Co., Effingham, Ill. (6) Si Million, pusher, and Jimmy Haynes, president, D. & H. Drilling Co.

(7) D. R. Thrasher, E. E. Bartoline, chief clerk, and F. W. Emerson, engineer, Western Pipe Line Co. (8) J. E. Matherly, production superintendent, Nations Oil Co. (9) Roy Routh, drilling superintendent, Centralia Pipe & Supply Co., supervising rig at work in Keensburg townsite.

(1) R. M. Swesnik, geologist, General American Oil Co. (2) O. E. Stimson, assistant superintendent, and H. L. Alexander, chief clerk, Central States Pipe Line Co. (3) R. W. McIlvain, division manager, Illinois producing division, Pure Oil Co. and his dog Tuck.

(4) Ed Shakely, exploitation engineer, and C. Drake, subsurface engineer, Shell Oil Co., Inc., Centralia, Ill. (5) J. A. Robbins, purchasing agent, and W. F. Wisdom, assistant superintendent of production, Pure Oil Co. (6) Pete Kennan, district material man, and Duane C. Randall, geologist, Carter Oil Co.

(7) J. R. Ferrall, tool pusher, Ferrall & Norris Drilling Co. (8) Jimmy Barnett, district engineer, and W. R. Scott, district chief clerk, St. Elmo district, Carter Oil Co. (9) Paul Wolfe, installation engineer, and J. W. Kattner, O'Meara & Kattner, independent producers.

Keensburg in Wabash County, Illinois, caused the year's first townsite drilling boom

Basin Shows Increase in All Departments

By HARRY F. SIMONS

ILLINOIS is being weighted in the balance for the third successive year, the result in previous trials being a distinct tipping of the beam in favor of the basin area. The first question was whether production in considerable quantities would be found in the basin area; and the second was whether Illinois would become a major factor in the nation's oil supply through the discovery of fields over a wide area.

The present question is the ability of Illinois, Indiana and adjacent areas to continue discovering new fields at the pace set during the past 2 years, and the maintenance of its production at a level which will fill the new pipe lines built in the area and continue the supply to refineries that are operating on Illinois crude.

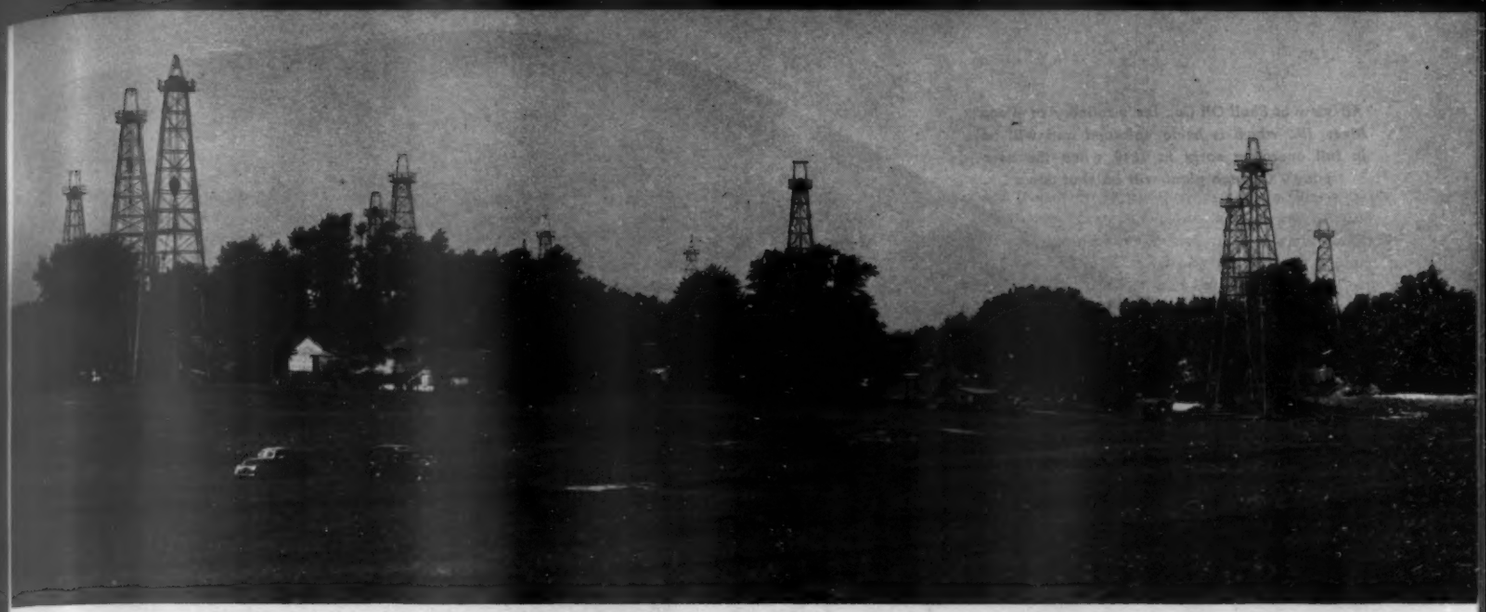
Since October 1, 1938, daily average production from the state has continued to rise sharply to an all-time high of 344,267 bbl. on September 30, 1939, an increase of 267,307 bbl., or 347 per cent. At the same time, the production per well has increased from 65.5 to 80.9 bbl. per day. During that period, 2,979 oil wells were completed, with an average initial production of 285.3 bbl. per well; the peak in initials coming in the week ending July 29 when 56 oil wells were completed for a total initial production of 31,933 bbl., an average of 570 bbl. per well. This was at the peak of the development of the McClosky-lime horizon in the Salem field and 17 wells accounted for 18,258 bbl. of the total initial for the week.

That Illinois was able to raise its output to such heights has been a surprise, many observers feeling that 200,000 to 250,000 bbl. per day would be the peak production from the Chester sands and the McClosky lime and others believing that the outlets for the production would have to wait on revisions of buying schedules of the refiners. That the basin has found an outlet for its production is evident as less than 5,000 bbl. were run to storage in the Salem field, the most prolific pool in Illinois, during the first week in October.

Increase in production has been mostly due to activity in the Salem and Louden fields, particularly the former. From June 17 to October 1, 1939, these two fields increased their daily output 87,475 bbl., from 178,450 to 265,925 bbl.; most of this increase was in the Salem field where pro-

ILLINOIS DISCOVERIES

Field and county—	Company, well and location—	Total depth (feet)	Pay depth (feet)	Prod. sand	I.P.	Date
Iola, Clay	Dick Duncan's No. 1 J. H. Liggett, SE NW SE Section 17-5n-5e	2,383	2,356	A. V.	42	5- 2-39
Hutton, Coles	W. R. Miller's No. 1 Griffin, SE NE NE Section 22-10n-11e	538	(?)	Penn. ss.	10	4-25-39
Whittington, Franklin	Gulf Refining and E. B. Hinman's No. 1, SE SW NE Section 19-5s-3e	3,068	2,869	Mc. and St. L.	199	7- 5-39
Junction, Gallatin	Coates' No. 1-B Green, SE SE SE Section 17-9s-9e	1,794	1,757	Waltersburg	130	5-16-39
Tonti, Marion	A. Harvey's No. 1 Mercantile Bank, N½ NE SE Section 33-3n-2e	2,193	2,160	McCl.	157	5- 2-39
Stewardson, Shelby	Aylward's No. 1 Wabash R.R., C N½ N½ Section 27-10n-5e	1,969	1,942	A.V.	28	4-18-39
Griffin, Gibson, Indiana	W. O. Allen's No. 1 Cooper estate, SE NW NE Section 13-3s-14w	2,920	2,863	McCl.	400	12- ?-38
Griffin (Ill. exten.), Wabash	Bartlett's No. 1 Stansfield, SW SE SE Section 19-2s-13w	1,719	1,713	Biehl	210	6-13-39
Mount Carmel, Wabash	Washburn's No. 1 Pfeifer, SW SW SW Section 13-1s-13w	2,556	1,940	Tar S.	44	6-27-39
Cordes, Washington	Blankenship's No. 1 Dennis, NE SW NE Section 14-3s-3w	1,239	1,228	Bethel	25	2- 7-39
Enterprise, Wayne	Whitcher Drilling Co.'s No. 1 Fitch, C N½ SE SE Section 3-1n-8e	3,100	3,087	McCl.	194	4-18-39
Barnhill, Wayne	Carl Robinson's No. 1 Felix, SW SE SE Section 27-2s-8e	3,409	3,386	McCl.	460	2- 7-39
Golden Gate, Wayne	New Penn Development Co.'s No. 1 Wagner, NW SW NE Section 30-2s-9e	3,441	3,432	McCl.	20	3- 7-39
Mill Shoals, White	Nations et al's No. 1 Belva McIntosh, C SE SW Section 31-3s-8e	3,405	3,360	McCl.	76	7-11-39
New Harmony, White	Sun Oil Co.'s No. 1 C. W. Ford, NW NE NE Section 18-5s-14w	3,017	2,998	McCl.	20	7-11-39
Storms (gas), White	Eason Oil Co.'s No. 1 Storms heirs, C W½ SE SW Section 14-6s-9e	3,079	2,954	McCl.	...	7-11-39
Cravat, Jefferson	Vawter et al's No. 1 Kell, NW SW NE Section 9-1s-1e	2,084	2,065	Bethel	72 oil 150 wtr.	8- 8-39
Dundas, Richland	Pure Oil Co.'s No. 1 H. C. Coen, SE SE SE Section 36-5n-9e	2,930	2,830	McCl.	1,458	9- 6-39
Grayville, Edwards	Kingwood Oil Co.'s No. 1 Johnson, SE SE NE Section 18-3s-11e	3,269	3,096	McCl.	415	9- 6-39
Keensburg, Wabash	T. D. Neff's No. 1 Bump, NW NE NW Section 9-2s-13w	2,424	2,397	Cypress	286	7-25-39
Springerton, White	P. F. Marrell's No. 1 Cox, NW NW NE Section 6-4s-8e	3,282	3,235	A.V.	368	8-29-39
Calvin, White	L. B. Liggett's No. 1 Holm, NE NW SE Section 32-3s-14w	3,032	3,016	McCl.	65 oil 120 wtr.	8- 8-39
Stokes, White	Penn-Ill. Oil Co.'s No. 1 Pyle, E½ SE NE Section 12-6s-8e	3,132	3,082	McCl.	423	10- 3-39
Carmi, White	Mazda Oil Co.'s No. 1 Baptist Orphanage, SE NE SE Section 22-5s-9e	3,228	3,224	McCl.	5 oil 55 wtr.	9-19-39
Phillipstown, White	Sun Oil Co.'s No. 1 J. Garner, SW SE SW Section 1-5s-10e	2,964	2,942	A.V.	testing	10- 1-39
Crossville, White	J. W. Carter et al's No. 1 Warren Johnson, NE SW NE Section 12-4s-10e	3,201	....	McCl.	testing	10- 1-39



duction rose from 131,850 to 200,485 bbl. daily, a jump of 68,630 bbl. during that period. In the same time Louden increased its runs from 46,600 to 65,440 bbl., while the other fields rose from 48,878 bbl. to 78,432 bbl., an increase of 19,564 bbl. in the latter and 18,840 bbl. in the former pool. Salem showed an increase of 364 wells, Louden 210 and other fields 300 during that period.

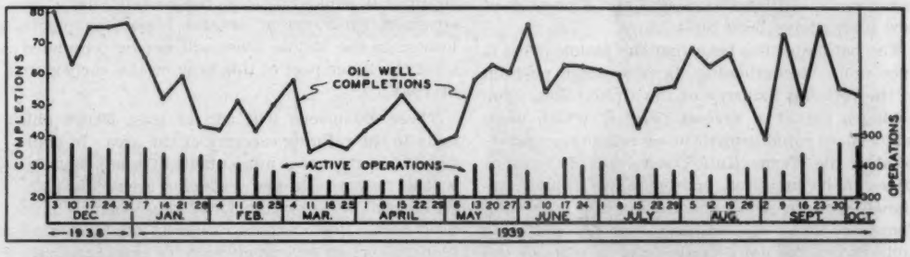
Both the Salem and Louden fields are now developed to the point where the companies controlling the largest blocks of acreage, (Texas Co. and Carter Oil Co.), are not being forced by offset drilling, and the remaining exploitation will probably be a routine matter. Over 700 wells remain to be drilled in Salem and over 400 in the Louden pool with most of these being completed in two or three sands; together with Pure Oil Co.'s development campaign in the Central basin fields, this gives Illinois an excellent backlog in both the drilling and production branches. The chart to the right shows operations and completions from December 3, 1938, to October 7, 1939, and indicates the trend for the coming year with rapid weekly fluctuations but an overall steady average. The decline from January to March is a reflection of the Illinois weather which retards field work even in areas where locations are forced.

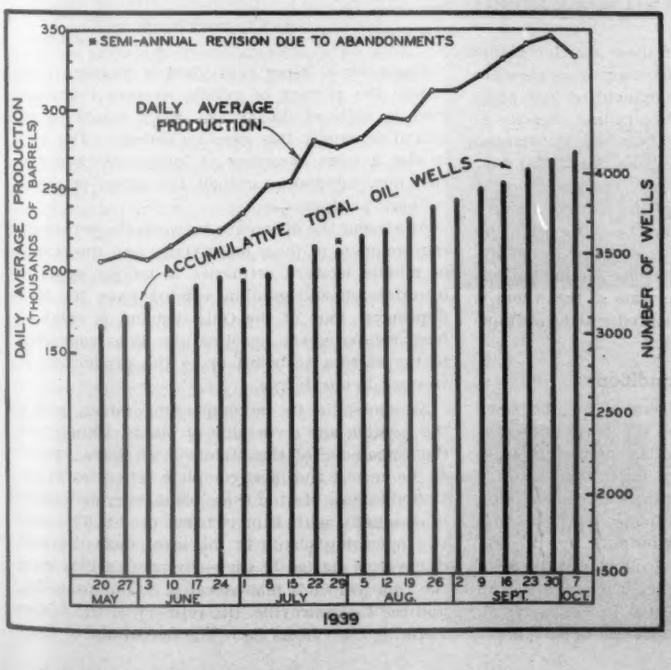
Independent companies in the basin have been carrying on an intensive wildcatting campaign, with many of the test wells being drilled near and sometimes within major company blocks That these leases remained open is not surprising in Illinois, many of the landowners refusing to lease due to a fear their property will not be developed. Texas Co., Carter Oil Co., Pure Oil Co., Magnolia Petroleum Co., and Shell Oil Co., Inc., during the past year, have preferred to develop the pools already discovered. Larger companies not interested in the 1938 discoveries (including Superior Oil Co., Gulf Refining Co., Tide Water Associated Oil Co., Phillips Petroleum Co. and Continental Oil Co.), have been quite active in wildcatting and in development in areas where they are interested.

Of the 25 discoveries only four were the result of exploration by a major company, while 21 were the work of independents, drilling on blocks of various size. Of the major company discoveries, Pure Oil Co.'s Dundas pool, in Richland County, appears to be the best, with the first well making an initial production of 1,458 bbl. from the McClosky lime. Some of the discoveries by independents were not large but for the most part they found fairly large pools.

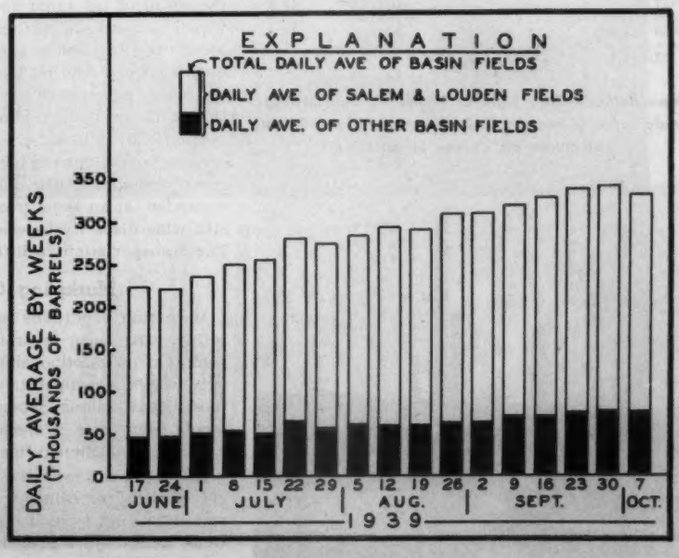
Two important features stand out in regard to the new fields, their location and the multiplicity of producing zones. For the most part they are located along the eastern side of Illinois in White, Edwards and Wabash counties, and in Gibson and Posey counties, Indiana. There were also important discoveries in Wayne and Jefferson counties. In addition to the "ace in the hole" of Illinois producers, the McClosky lime, and the already discovered Cypress, Aux Vases, and Bethel, important production was found in the Waltersburg, Tar Springs, and the Biehl sand. The Biehl is a sand in the base of the Pottsville, of Pennsylvanian age; the McClosky is in the Fredonia lime of the lower Mississippian, and the remainder are all members of the Chester series or upper Mississippian.

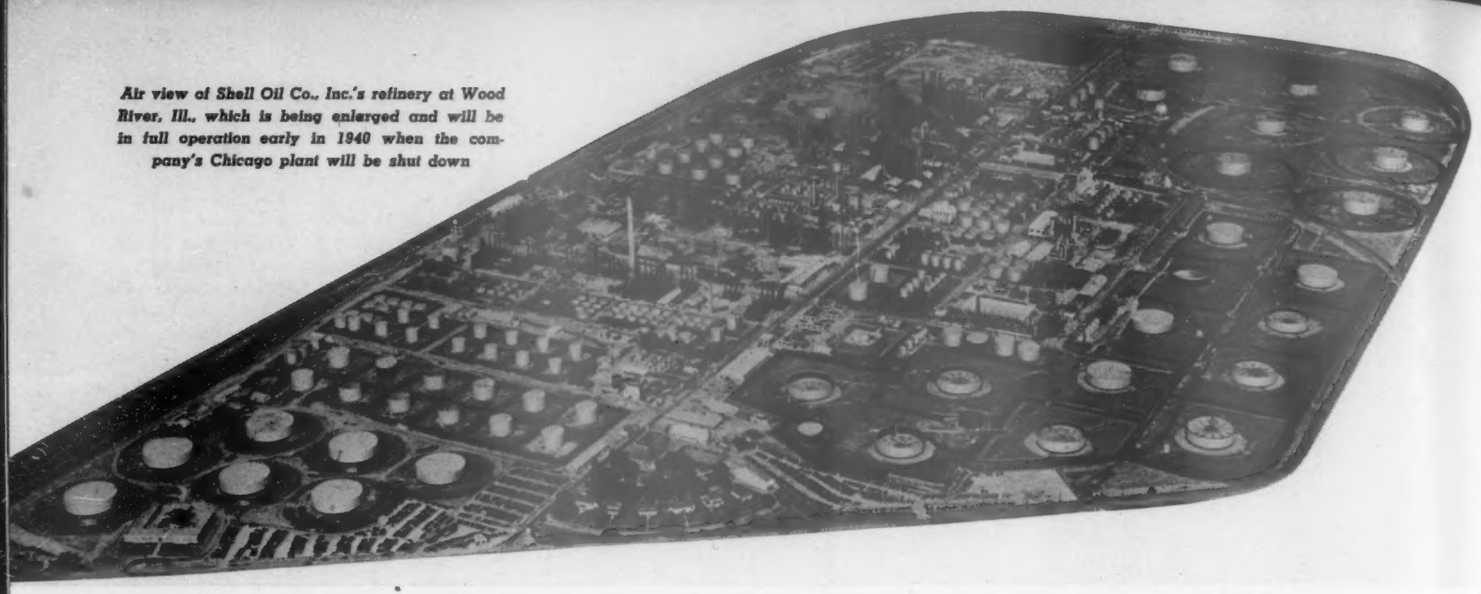
(Continued on Page 76)





Above: Active operations and oil completions show seasonal drop due to bad weather. Below left: Daily average production and accumulative total of oil wells gives indication of production trend. Below right: Daily average production chart shows Salem and Louden fields dominate basin production





Air view of Shell Oil Co., Inc.'s refinery at Wood River, Ill., which is being enlarged and will be in full operation early in 1940 when the company's Chicago plant will be shut down

Major Changes Reflected in Illinois Refining Operations

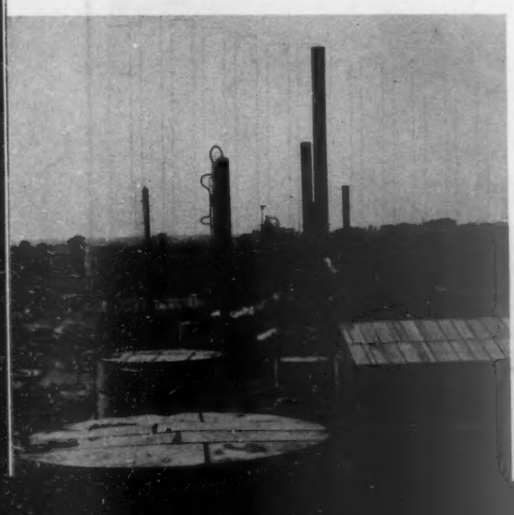
THE rapid increase in the crude-oil production of the Illinois basin area over the past 2½ years has brought major changes in refining operations of that area and the entire Middle West. Practically all of the major and semi-major refineries in operation before the new production was discovered have been expanded and a number of new plants have been built.

The net result has been that the Middle West is once more strengthening its percentage position in the refining industry of the United States following a period of several years in which there was a more rapid growth in several other areas—notably the Texas Gulf Coast. The Bureau of Mines in its monthly reports groups Illinois, Indiana, western Ohio, Michigan, Kentucky and Tennessee under one refining area. The following table shows the daily crude runs to stills of the refineries in that area over the past 5 years:

Year—	Bbl. daily	Per cent of total
1939*	515,000	15
1938	447,000	14
1937	450,000	13.8
1936	403,000	13.8
1935	355,000	13.4

*July, 1939.

Pana Refining Co.'s plant at Pana, Ill., has 3,500-bbl. crude capacity and a 1,750-bbl. cracking plant. It manufactures all grades of gasoline



This table shows that not only have crude runs to stills increased but also these runs represent a larger percentage of total operations in the United States than they did previous to the "rediscovery" of Illinois as a major producing area.

The refinery position of the Middle West will continue to expand through the coming year. Construction programs at several important plants located in the Middle West will not be completed until the latter part of this year or the early part of 1940.

These extensions will add at least 50,000 bbl. daily to the refining capacity of the area. In addition it is certain that more plants of small capacity will be built within the producing area. Since the early part of this year, 11 of these plants have been built. Most of these refineries are skimming plants although several either have cracking facilities at this time or expect to add units in the near future.

The operation of most of these smaller plants will be temporary. As in other new areas they are the result of the rapid development of new pools which do not have sufficient pipe-line capacity to absorb the available crude oil output. Substantial quantities of crude oil have been available under the posted prices over the past 2 years and part of this crude has gone to new plants located adjacent to the fields. While there have been important increases to pipe-line capacity as explained in another article in this issue, and crude production has expanded at an even greater rate so that there is still wide disparity between production and pipeline transportation facilities.

Marketing Conditions

Marketing conditions in general for the small refiner have been favorable. There is large consumption of gasoline and other petroleum products within a comparatively small area. Most of these small plants depend on tank-wagon shipments from their refineries to furnish outlets for a large part of their refinery output.

Attractive rail rates have also widened the refinery markets for Illinois crude. There are regular rail shipments to plants located in Pennsylvania, Ohio, Kentucky, Wisconsin and the upper part of Illinois. Shipments have also been made to plants in Michigan.

It is apparent that the saturation point in the expansion of the Middle West's refining capacity has not been reached, provided crude supplies within the area continue to increase. Present plants only furnish about 50 per cent of the gasoline consumed in the area where most of the plants are located. The daily gasoline consumption of eight states which have been termed the logical Illinois marketing area, based on June gasoline tax payments, follow:

State—	Gasoline consumed (bbl. daily)
Illinois	101,000
Indiana	47,000
Kentucky	18,600
Michigan	85,800
Minnesota	40,900
Ohio	98,300
Tennessee	17,100
Wisconsin	42,800
Total	451,500

Assuming a 56-per cent yield of gasoline from crude—the average of middle western refiners—runs to stills of 800,000 bbl. daily would be required to supply this gasoline demand. The area is also a large consumer of kerosene, distillates, fuel oils, lubricants and all the other principal refinery products.

At present the difference between the petroleum requirements of these eight states and the output of middle western refineries is largely supplied by crude oil and gasoline coming from the Mid-Continent. Part of the Ohio demand is obtained from refineries and gasoline pipe lines connected to the eastern seaboard or to the production in western Pennsylvania.

As shown in the accompanying tables, giving the location and ownership of plants, Illinois and the remainder of the Middle West have several of the largest and most complete refineries in the United States. Most of these plants operate partially or wholly with Illinois basin crude. The only two operating plants in the area when the new discoveries started in the early part of 1937 were the Ohio Oil Co.'s plant located at Robinson, Ill., and the Lawrenceville, Ill., refinery of the Indian Refining Co. (Texas Co.) The operations of these

two plants, which are among the oldest in the Middle West, have since been expanded.

One of the major changes in refining brought about by the Illinois development has been the St. Louis groups of refineries. The plants of the Standard of Indiana and the Shell Oil Co., Inc., located at Wood River, Ill., and that of Socony-Vacuum Oil Co., Inc., at East St. Louis, Ill., have operated for years with crude secured by pipe line from Oklahoma and Kansas. Now large quantities of Illinois crude are going to Shell and Socony-Vacuum refineries and smaller deliveries are also being made to the Standard plant.

Partially as a result of this Illinois development the Shell refinery at Wood River is being increased in capacity from 45,000 bbl. daily to 75,000 bbl. daily. When this expansion program is completed it is planned to shut down the company's refinery at East Chicago and convert the present crude line between Wood River and East Chicago to gasoline service.

In addition to increasing the crude-oil capacity of the refinery all phases of the operation are to be rounded out. The new units include catalytic extension of the gas-recovery system, polymerization and alkylation for the manufacture of high-octane gasoline. A modern compounding and barreling plant for lubricating oils has just been completed.

A 15,000-bbl. daily Houdry unit described elsewhere in this issue is being completed at the Socony-Vacuum refinery. The Socony-Vacuum company is also enlarging its refinery near Detroit, Mich., which is also now operating with Illinois crude obtained through the new crude-oil line of the company that connects the field to Lima, Ohio.

Refineries of the Standard Oil Co. of Ohio located at Lima, Cleveland and Toledo, Ohio, and Covington, Ky., which formerly operated almost exclusively with Mid-Continent crude, now secure most of their supplies from Illinois.

The operations of the Globe Oil & Refining Co., located at Lemont, Ill., have also been expanded as a result of the Illinois development. The refinery secures crude both by pipe line and rail shipments. Through changes made in the pipe-line movement of crude oil, the refineries of the Cities Service Oil Co., Socony-Vacuum Oil Co., Inc., and the Texas Co. located in the Chicago area also secure part of their crude supplies from the fields of southern Illinois.

Transportation Costs

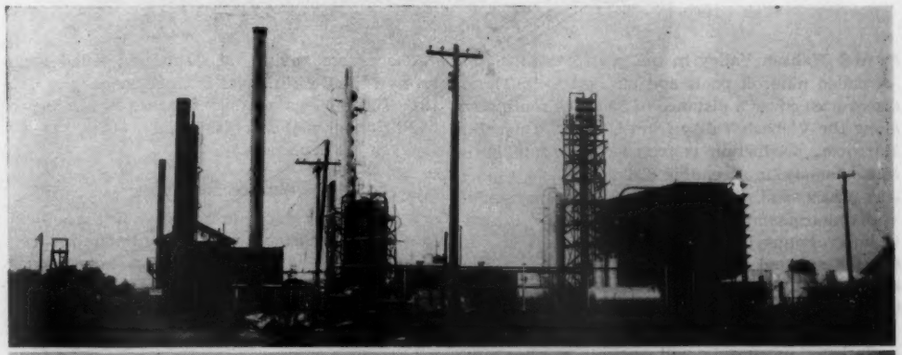
One of the principal advantages enjoyed by refineries of the Illinois basin area and adjoining states has to do with transportation costs. Up to 2 years ago, middle western refineries obtained better than 90 per cent of their crude supplies from Mid-Continent fields. The crude was brought to the larger refineries by pipe line through a gradual expansion of transportation facilities extending over a period of 30 years. The products of these plants were distributed within the middle western states adjacent to the refineries.

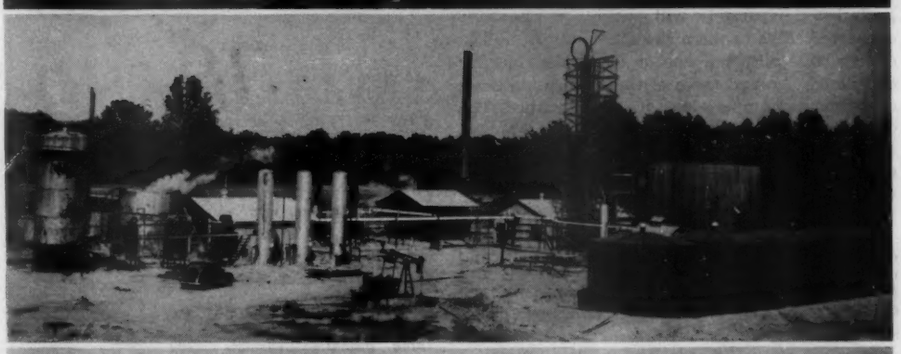
In addition to supplying the market it was necessary to ship large quantities of refinery products by rail from refineries located in the Mid-Continent. The competition of refineries within and outside the Middle West determined market trends. More recently two large gasoline pipe lines connecting Mid-Continent refineries to distributing terminals in the Middle West became market factors.

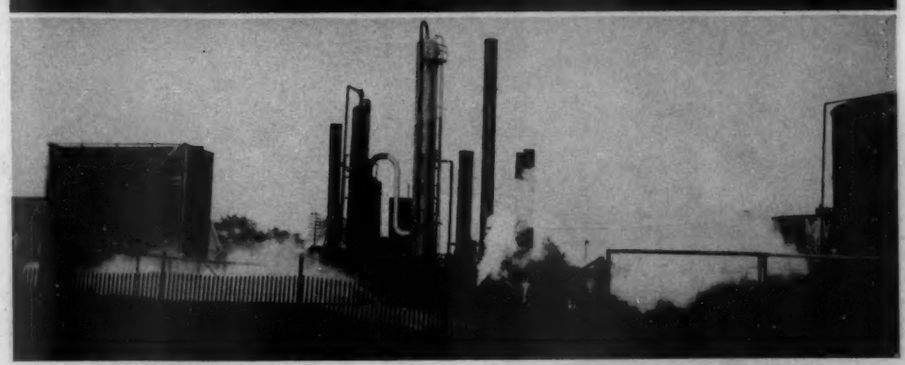
The increase in Illinois and Michigan production to approximately 400,000 bbl. daily has changed this comparative situation. This crude is made available to refinery outlets at substantially lower transportation costs than the Mid-Continent supplies. This situation, together with the fact that

(Continued on Page 125)

Shown below are several refineries operating in the Illinois basin. They are: Top: Allied Oil Corp.'s refinery at St. Elmo, Ill., which operates on crude produced by independents in the Louden field. It has a 4,000-bbl. capacity with 2,000-bbl. cracking unit and was built in the spring of 1938. Second down: Cascade Refining Co.'s plant (Potter Brothers) in the Salem field. A cracking unit may be added at a later date. Third down: Indian Refining Co. (Texas Co.) at Lawrenceville, Ill. Cracking capacity is 18,000 bbl. and 7,500 bbl. This plant has long been an important feature in Illinois and was one of the first outlets for basin crude. Fourth down: Two topping plants located close together on the south side of Centralia. Centralia Refining Co.'s plant (capacity 2,000 bbl.) at left, and Egyptian Refining Co.'s plant (capacity 2,000) at right. Bottom: Remodeled plant of the Advance Refining Co. at Centralia, Ill. This was one of the first topping plants to be constructed in the area following the discovery of the Centralia field. Capacity of this plant is 2,000 bbl. daily







Six Horizons Producing Along Wabash Valley

THE Wabash Valley in the past 5 months has added nine oil pools and one gas well. These discoveries cover a distance of 35 miles southwest along the Wabash Valley from Mount Carmel, Ill. Moreover, production is from six separate horizons; namely, in ascending order: McClosky lime, Aux Vases sand, Cypress sand, Tar Springs sand, Waltersburg sand and Biehl sand. The Biehl sand is lower Pennsylvanian, and other sands are of Chester age and the McClosky lime is the oolitic zone or zones, as the case may be, in the Fredonia limestone member of the Ste. Genevieve.

Discoveries occur at a dizzy pace. Some of the pools listed separately will possibly prove to be connected. Five of these fields are still in the discovery class with but one or two wells thus far completed. Around three of these there are nests of derricks and operations are being rushed. The other two, the Heston area in Section 8-3s-13w, and the Crossville area, opened by the Sun Oil Co., will be developed more slowly as the wells were light.

Structure and Sand Conditions

The oil fields of the Wabash Valley are only partially adjusted to structure. Structurally, the Griffin trend is a series of highs with a northeast-southwest alignment.

In association with this structural trend, many of the sand horizons are unusually well developed. The producing horizons are continuous (lenticular), however, and it is necessary both to be on favorable structure and to encounter a sand lense.

Most of the sand lenses of the Cypress, Waltersburg and Tar Springs carry water, and it is necessary to work out a water table in each local sand body. This situation makes use of electrical logs invaluable.

McClosky-lime production, on the other hand, is well adjusted to structure. Unless the structure has closure the McClosky does not produce.

The accompanying map shows detailed structure on the Griffin trend from Keensburg to Griffin. The various producing zones are indicated by different well symbols. The inset shows the fields of the Wabash Valley.

Ultimate Recovery

It is yet too early in the life of these fields to estimate accurately what the ultimate recovery from the various horizons will be. Consensus at present gives the Cypress sand 250 bbl. per acre-foot, the Waltersburg sand 300 bbl. per acre-foot, and the McClosky lime from 100 to 600 bbl. per acre-foot. The wide limits on McClosky production will be governed by both porosity and permeability. The sand figures are based on areas where the sand is a solid body. Where shale and sandy shale breaks are in the producing zone, those parts must be deducted from the overall footage unless complete cores are taken. Electrical log records are the best data from which sand-thickness maps may be built, and all operators should have them made.

Fields of the Wabash Valley

The Griffin pool, which was the discovery field of the district, is now producing from four horizons. There are 320 acres of proven McClosky-lime production, 1,400 acres of Cypress-sand production, six wells completed in the Waltersburg sand, and two wells in the Tar Springs sand. The McClosky-lime pay averages 9 ft. in thickness, and the wells have average initial productions of 250 bbl. per day naturally. The Cypress sand averages 18 ft. thick and the wells average 300 bbl. initially. A few of the Cypress wells have required a shot but usually not. The Waltersburg sand wells, centering around the SW cor. Section 18-3s-13w, are 250-bbl. completions from sand up to 33 ft. in thickness. Bond's No. 1 Dunn, 4,000 ft. east of the Waltersburg production, showed on the electrical log 75 ft. of Waltersburg sand with the upper 25 ft. carrying oil. The writers believe there will be quite a belt of Waltersburg production developed along the southeast side of the Griffin pool. The two Tar Springs wells are both on the northwest edge of the field and are about 1 mile apart. They are good for 300 to 400 bbl. each, and are Lewis Production Co.'s No. 4-B Cooper-Hausman, SE SE NE Section 12-3s-14w.

The photograph at the right was taken at the south end of Griffin field. The Griffin pool was the discovery field of the district and is now producing from four horizons. The view below shows one of the larger rigs at work in Keensburg. The Keensburg pool is by far the most active pool in the Wabash Valley, chiefly because of the town-lot drilling within the village of Keensburg. Three gathering systems and loading racks are serving this booming village

By KEITH A. SPITZNAGEL
and HASTINGS MOORE
Consulting Geologists, Evansville, Ind.

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Above: Removing a portable rig from location after getting a dry hole on the west side of Keensburg townsite. Right: Map showing detailed structure on the Griffin trend from Keensburg to Griffin

and Lewis Production Co.'s No. 4-D Cooper-Hausman, NE SE NW Section 12-3s-14w.

Directly north of the Griffin pool across the Wabash River in Illinois is the North Griffin pool. The first well in this field was quite a surprise when Bartlett's No. 1 Stansfield, SW SE SE Section 19-2s-13w, made several hundred barrels from the lower Pennsylvanian sand, correlated tentatively as the Biehl. The field now has two Biehl-sand wells and 16 Cypress-sand wells. The Biehl wells are classed as 200-bbl. wells and the Cypress wells average 125 bbl. from an average of 12 ft. of pay. Sol Simon recently extended the Cypress-sand production a mile northeast with his No. 1 Elkins, SW SW SE Section 20-2s-13w, good for 180 bbl. from 2,478-86 ft. While North Griffin is more spotted than Griffin proper, there is apparently 600 acres of proven Cypress production. The McClosky horizon has been tested several times in the North Griffin field. Some of the wells had saturation, but porosity was not sufficient to permit successful completions.

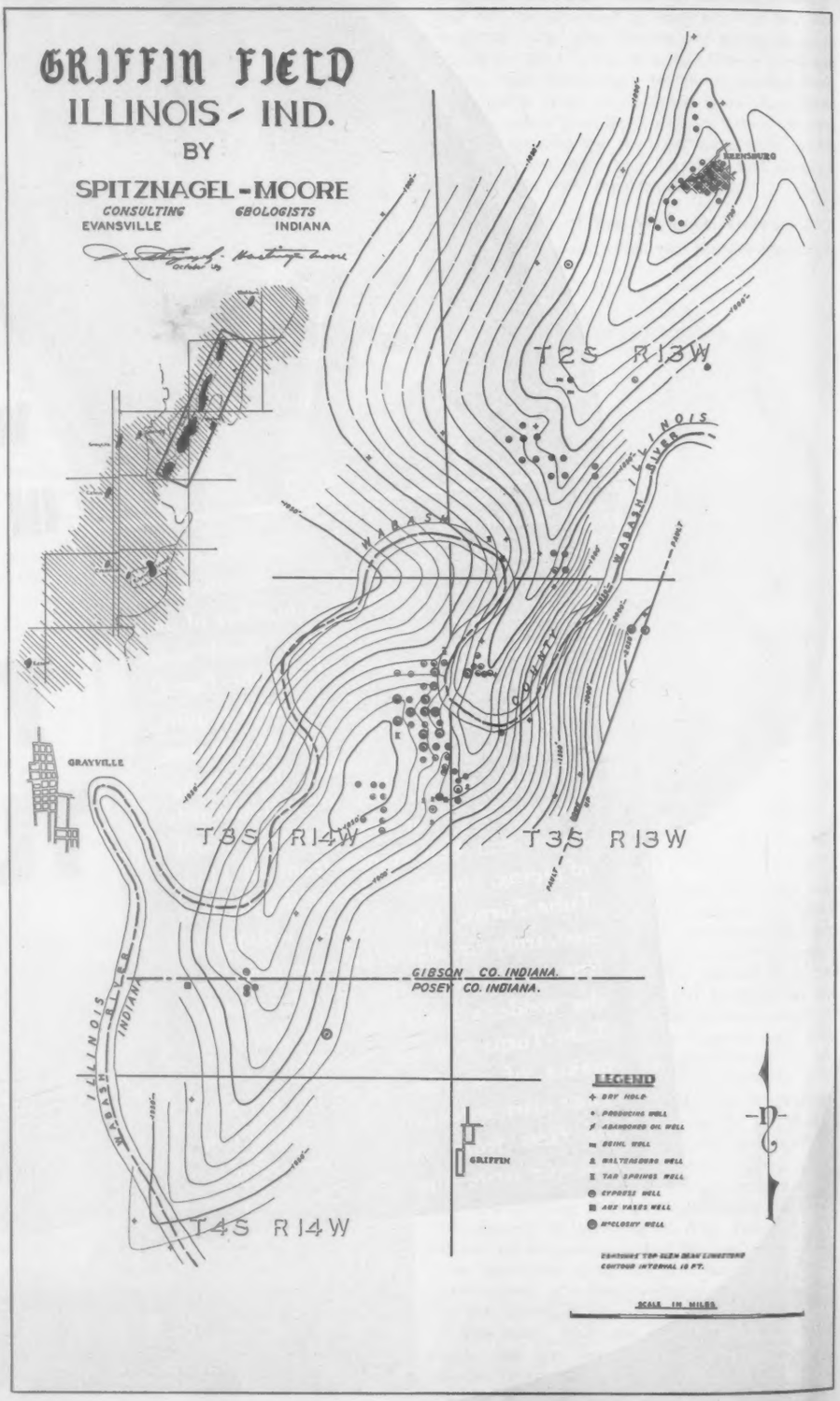
The Griffin pool proper is cut off on the south by three dry holes in Section 26-3s-14w. South of these dry holes are several fine Cypress-sand wells, which the writers have elected to call the South Griffin pool. Egan's No. 1 Keck, NE NE NE Section 34-3s-14w, has been completed in the Cypress sand flowing 565 bbl. per day naturally from 2,490-2,507 ft. The north offset, Continental's No. 1 Keck, made 25 bbl. per hour from 2,502-16 ft. and the east offset, Lon Huddleston's No. 1 Keck, is good for 38 bbl. per hour from 2,535-55 ft. There are Cypress failures within a mile of this area in six directions so it cannot be very large.

Nine Wells in One Pool

Superior Oil Co.'s Waltersburg-sand pool on Ribeyre Island, Sections 9 and 10-5s-14w, Posey County, Indiana, and White County, Illinois, is about 4 months old. It boasts of nine wells with average sand thickness of 40 ft. and average initial productions of 350 bbl. per day. One well has been completed in the Tar Springs sand as a 175-bbl. pumper. It is the Superior Oil Co.'s No. 4 New Harmony Realty Co., NE SW SE Section 9-5s-14w. Proven acreage amounts to 500 acres with close-in dry holes to the north and south indicating little further expansion in these directions. The Cypress and McClosky horizons have been tested unsuccessfully on top of this structure, so it is indicated that this field will be a two-sand pool.

The Keensburg pool is by far the most active pool in the Wabash Valley, partly because of the fine Cypress-sand wells being completed there but mostly because of the town-lot drilling with-

(Continued on Page 70)



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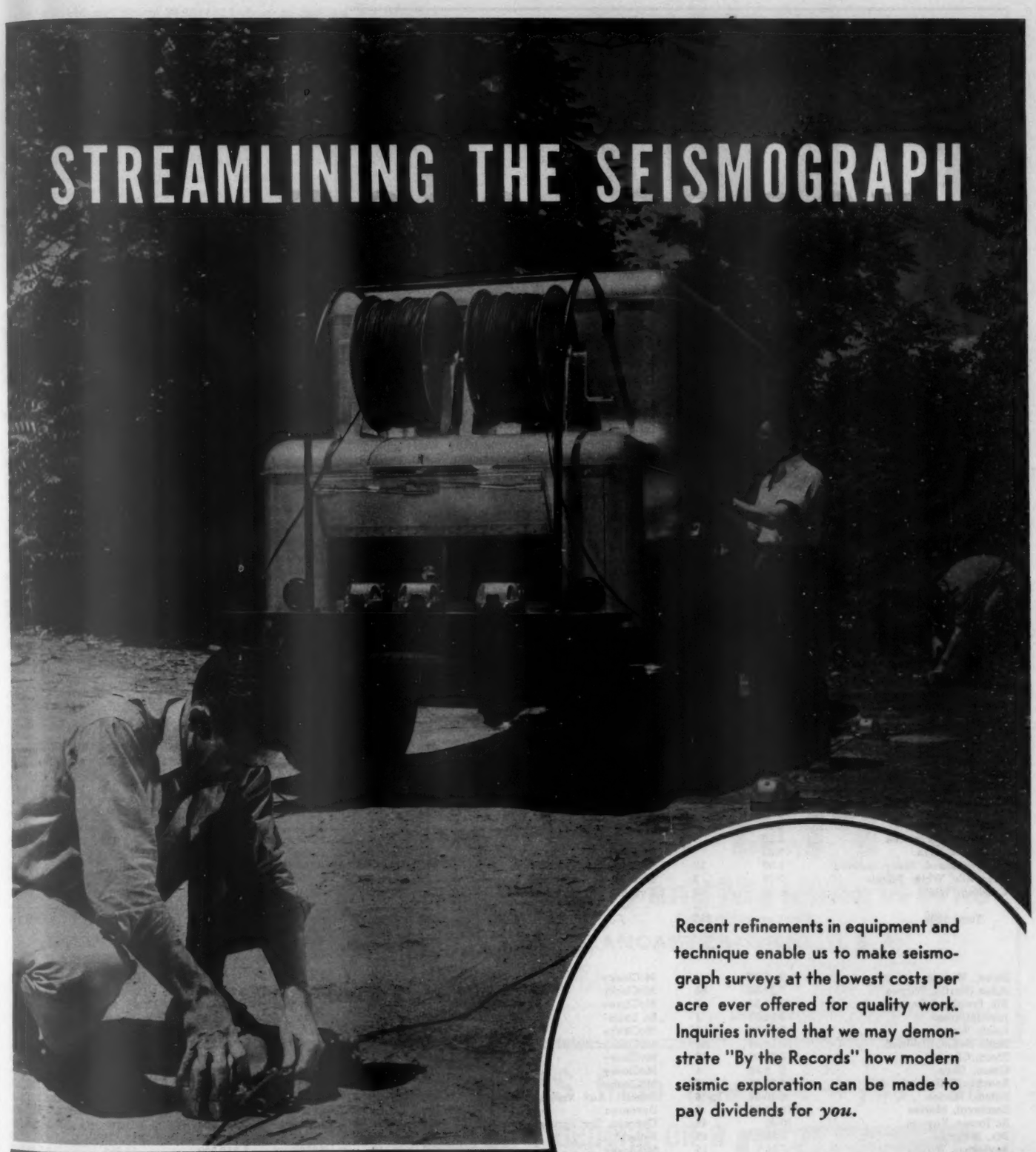

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Reserves of Illinois Exceed 500,000,000 Barrels

By HARRY F. SIMONS

THE exploration and drilling campaign in the Illinois basin, which has been increasing rapidly over the past 3 years, has resulted in the discovery of an estimated 495,132,000 bbl. of recoverable reserves from nearly 56,000 productive acres. During the same period, the cumulative production for the discovered fields has amounted to 70,237,173 bbl., making a net gain which may be added to the nation's reserve of oil of 424,894,827 bbl. In addition, the old fields in the state account for another 30,000,000 bbl. which may be expected from the more than 10,000 wells in those areas. The total reserve in Illinois and western Indiana thus amount to 454,894,827 bbl.

Developments during the past 8 months provide more data for the estimation of the amount of oil underground than previously. The drilling of almost 2,000 additional producing wells has practically outlined the larger fields and has provided invaluable data on sand thickness, porosity, and water level in fields having a hydrostatic drive. Production of these wells has indicated the rate of decline and to great extent points to the ultimate recovery which may be expected. The reserve of areas were computed at this time on the basis of developments to date.

The two major fields in the basin account for most of the reserve as well as most of the production at the present time with a total of 382,000,000 bbl. of recoverable oil, 182,000,000 in Louden and 200,000,000 in Salem. Louden has produced

DISCOVERIES IN 1939

Field and county—	Discovery date	Completions Sept. 15, 1939	Producing formation	Acreage proven	Formation thickness	Production per acre	Estimated recoverable oil	Production Sept. 1	Estimated reserves
Barnhill, Wayne	2- 7-39	28	McClosky	400	7	3,000	1,200,000	180,882	1,019,118
Cravat, Jefferson	8- 8-39	4	Bethel	40	19	2,500	100,000	.....	100,000
Calvin, White	8- 8-39	2	McClosky	40	6½	2,800	112,000	.....	112,000
Cordes, Washington	2- 7-39	69	Bethel	640	7	1,750	1,100,000	219,225	880,775
Dundas, Richland	9- 6-39	...	McClosky, Cypress	40	15—15	4,000	160,000	.....	160,000
Enterprise, Wayne	4-18-39	25	McClosky	320	11	3,200	1,024,000	338,652	685,348
Griffin, Gibson, Indiana North Griffin, Wabash, Illinois	11- 1-39 6-13-39	70	McCloaky, Aux Vases, Cypress, Tar Springs, Waltersburg, Biehl	2,500	23	6,000	15,000,000	28,038	14,971,962
Grayville, Edwards	9- 6-39	4	McClosky	40	8	2,500	100,000	.....	100,000
Hutton, Coles	4-25-39	.	Pennsylvanian sand	10	7	1,500	15,000	.....	15,000
Iola, Clay	5- 2-39	2	Aux Vases	20	23	3,500	70,000	2,795	67,205
Junction, Gallatin	5-16-39	4	Waltersburg	20	21	2,500	50,000	4,293	45,707
Keensburg, Wabash	7-25-39	.	Cypress	520	25	3,500	1,820,000	7,150	1,812,850
Mill Shoals	7-11-39	12	McClosky, Aux Vases	300	27—30	4,000	1,200,000	9,923	1,190,077
Mount Carmel	6-27-39	4	Tar Springs	40	18	3,500	140,000	.....	140,000
Stewardson, Shelby	4-18-39	1	McClosky	10	..	1,500	15,000	2,369	12,631
Tonti, Marion	1-39	16	McClosky	160	7½	2,500	400,000	87,472	312,528
Stokes, White	9-39	...	McClosky	40	9	3,500	140,000	.....	140,000
Marcoe, Jefferson	3-39	2	McClosky	20	8	2,800	56,000	4,459	51,541
Whittington, Franklin	8-39	1	McClosky	40	7	2,500	100,000	1,826	98,174
Walker, Gibson	7-39	.	McClosky	40	7	2,000	80,000	.....	80,000
Ribeyre Island, Posey, Indiana	6-39	12	Waltersburg, Tar Springs	240	18—20	3,500	840,000	.....	840,000
Crossville, White, Illinois	8-39	2	McClosky, Aux Vases	40	9—12	3,000	120,000	.....	120,000
Cowling, White	9-39	4	Cypress	40	18	3,500	140,000	.....	140,000
Total 1939		263		5,560			23,982,000	887,084	23,094,916

DISCOVERIES IN 1938

Aden, Wayne	2- 2-38	4	McClosky	80	9	4,000	320,000	122,595	197,405
Aden (North), Wayne	7-27-38	68	McClosky	640	11	4,500	2,880,000	746,952	2,133,048
Elk Prairie, Jefferson	11-11-38	1	McClosky	10	6	2,000	20,000	690	19,310
Ina, Jefferson	6-29-38	1	St. Louis	10		2,000	20,000	10,647	9,353
Leich, Wayne	9-14-38	6	McClosky	80	8	4,000	320,000	52,117	267,883
North Noble, Richland	10-12-38	48	McClosky, Weller	1,000	11—11	4,500	4,500,000	445,411	4,054,589
Flora, Clay	6-22-38	16	McClosky	160	5½	3,500	560,000	165,247	394,753
Olson, Clay	2- 2-38	4	McClosky	160	5½	3,000	480,000	82,396	397,604
Roaches, Jefferson	11-29-38	5	McClosky	50	7	2,800	140,000	32,970	107,030
Salem, Marion	6-30-38	1,378	Benoist, Aux Vases, McClosky	10,000	45—55—12	20,000	200,000,000	30,688,632	169,311,368
Sandoval, Marion	12-20-38	8	Devonian	160	4	1,800	288,000	.....	288,000
St. James, Fayette	10-38	48	Cypress, Tar Springs	640	10½—18	3,500	2,240,000	297,360	1,942,640
Dix, Jefferson	1-38	49	Bethel	2,000	11½	4,500	9,000,000	611,431	8,388,569
Boyleston, Wayne	7-38	15	McClosky	480	10	3,200	6,650,000	59,652	6,590,348
Olney	5-38	35	McClosky	480	6½	3,000	1,440,000	646,748	793,352
Noble (South), Richland	6-38	10	McClosky	220	5	2,800	396,000	252,470	143,530
Schnell, Richland	2-38	4	McClosky	80	6	3,000	240,000	118,795	121,205
Total 1938		1,703		16,170			229,494,000	34,334,013	195,159,987

DISCOVERIES IN 1937

Clay City, Clay and Wayne	.....	356	McClosky, Cypress	6,600	10—12	4,500	30,000,000	9,952,308	20,047,692
Clone, Wayne	.....	81	McCloaky	1,100	11	4,000	4,400,000	1,499,651	2,900,349
Louden, Fayette	.....	1,136	Weller, Bethel, Paint Creek	20,000	25—30—35	9,100	182,000,000	11,909,452	170,090,548
Noble, Richland	.....	131	McClosky	3,000	7½	4,000	12,000,000	5,536,891	6,463,109
Centralia, Marion and Clinton	.....	525	Benoist, Cypress	2,600	22—25	4,000	10,400,000	4,620,960	5,779,040
Patoka, Marion	.....	100	Bethel	800	15	3,500	2,800,000	1,491,237	1,308,763
Binard, Wayne	.....	1	McClosky	20	7	2,800	56,000	5,577	50,423
Total 1937		2,330		34,120			241,656,000	35,016,076	206,639,924
Grand total		4,296		55,850	14 ft. (av.)		495,132,000	70,237,173	424,894,827

11,909,452 bbl. and Salem 30,688,632 bbl. up to September 1, making a net reserve in the ground of 239,401,926 bbl., over 56 per cent of the total reserve of the basin.

Louden was discovered late in 1937 and Salem was discovered in midyear of 1938; both have experienced an extremely active drilling campaign during the past 12 months, with both fields being nearly completely developed at the present time and mostly inside locations remaining to be exploited. Louden has 1,136 wells and Salem has 1,379 wells at the present time. Much of the Louden field is on a 20-acre spacing, and some of the Salem field is likewise on a wider than 10-acre spacing. Both areas are productive from three horizons, Salem having Benoist and Aux Vases sand and McClosky lime under practically its entire extent and Louden having the Cypress, Paint Creek stray and the Bethel sands productive under nearly two-thirds of its entire extent.

Salem Better Field

Salem has the greater thickness of pay sands, better porosity and permeability, and higher initial production. While of substantially lesser extent than Louden, it is slightly the better oil field and entitled to a higher reserve figure. However, Salem may ultimately produce less oil than Louden, due to the abuse to which it has been subjected, whereas Louden has been conservatively handled.

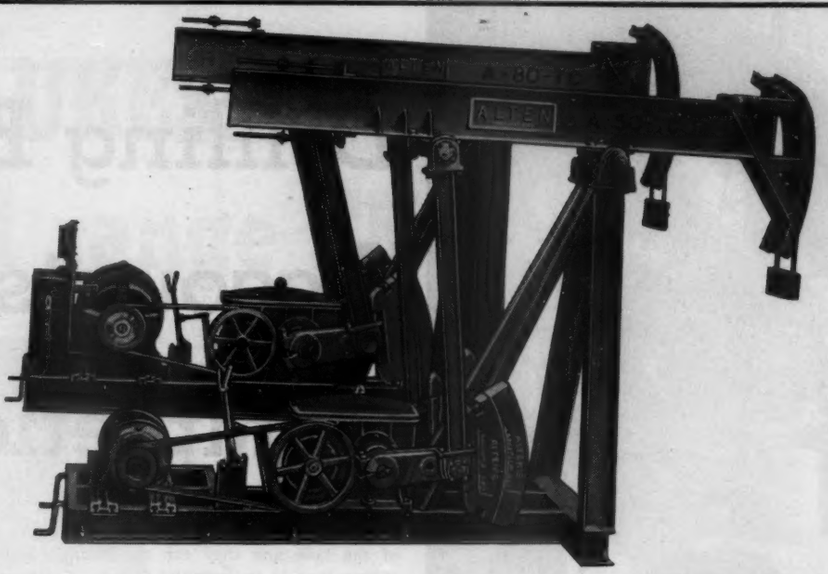
Worthy of note are the amounts credited to the fields discovered during each of the years since the revival in Illinois, 1937 leading with an initial estimated reserve of 241,656,000 bbl., a production of 35,016,076 bbl. and a present reserve of 206,639,924 bbl.; 1938 is second with an original estimated reserve of 229,494,000 bbl., a production of 34,334,013 bbl. and a present reserve of 195,159,987 bbl.; and 1939 is last with an estimated reserve of 23,982,000 bbl., a production of 887,084 bbl. and a net reserve at the present time of 23,094,916 bbl.

This may be credited to the difficulty of estimating the reserve of a field shortly after it has been discovered, practically everyone underestimating both Louden and Salem, the two fields which affect the figures most. The Aux Vases sand in the Salem pool proved to be a very good producing horizon, while the Paint Creek stray was discovered in Louden after it was considered a two-pay field.

Griffin May Be Larger

This indicates that the estimate of the Griffin area, Wabash County, Illinois, and Gibson and Posey counties, Indiana, may be eventually allotted a much larger reserve figure after more development has taken place. At the present time, Griffin and its north and south extensions are credited with a reserve of 15,000,000 bbl. from a total of six zones known to be productive in the area, including the McClosky lime, Cypress, Waltersburg, Tar Springs, and Biehl sands. There has been no Bethel or Benoist production discovered in the area. The McClosky and Cypress are very productive in some areas, but all of the pay zones are discontinucus and any accurate evaluation of the area must wait on more drilling, as any crediting of reserves on the basis of the extent of the structures involved might lead to an unjustifiably high figure.

The rate of withdrawal of crude from the reserve is unusually high when other areas are considered. At its present rate of production, the basin would be devoid of oil at the end of 3½ years, despite its huge reserve. The rate of discovery has likewise been three and a half times faster than the rate of production, but it is unlikely Illinois can continue to discover oil at this rate, as this would amount to nearly 125,000,000 bbl. annually. The areal extent involved and the productivity of the formations makes it very improbable that over a period of years the basin could continue to discover annually 14.5 per cent of all the reserves discovered in the United States during 1938.



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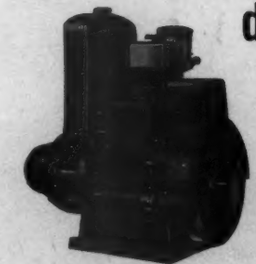

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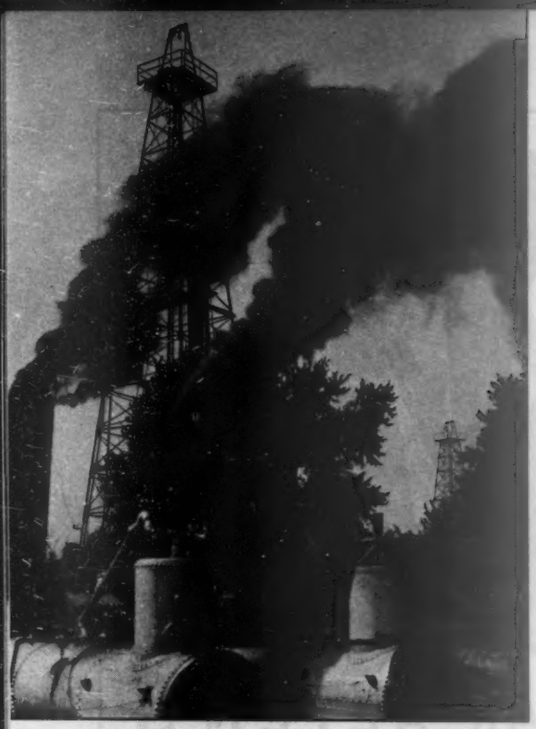


Battery of boilers in Keensburg being fired with oil and belching smoke from the stacks

Drilling Equipment Accounts for Illinois Completion Rate

THE Illinois basin, with an average of 73 completions weekly during the past 18 weeks, has kept approximately 200 rotary and a like number of spudding machines busy drilling holes and completing wells. Rigs of all types have drilled more than 5,000,000 ft. of hole during the past year. The most widely used method of drilling in both Illinois and Indiana is the rotary method, while Kentucky, after a brief flurry of drilling in the Birk City pool, has gone back to the use of spudding machines and only three rotaries are operating in that state at the present time.

As there were no rotary drilling rigs in the area at the start of the present development, all of them either were imported or purchased for this work. The reduction of drilling activity in other areas which accompanied the increase of production in Illinois, led to the shipment of many rigs from Kansas, Oklahoma, and Texas to the Sucker State. Few rotary drilling contractors were interested in coming to the area at the start of the play as there was no way of estimating the amount of work that might be obtained. There was also what amounted to a tradition that the territory east of the Mississippi River was for cable tools only. The original price in the basin was much higher than it is at the present time and larger companies had to bring rigs of their own into the state in some instances.

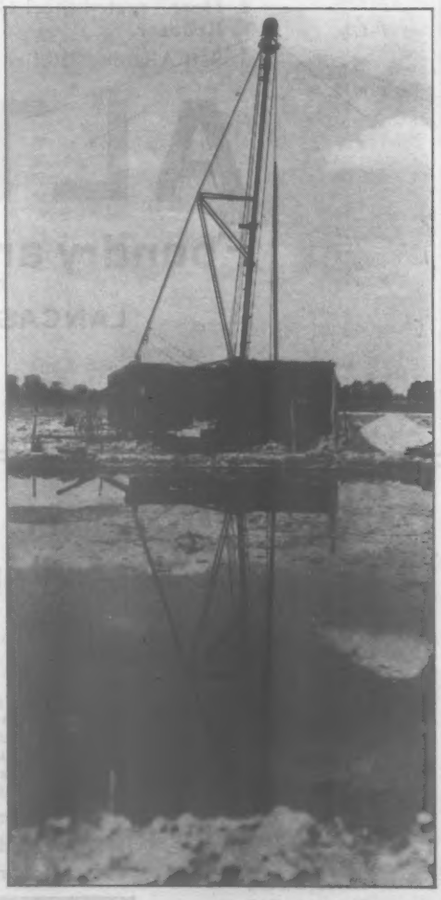
As soon as the activity got well under way in the summer of 1937, many contractors with rigs suitable for drilling to 4,000 ft. began to take an interest in the area and began shipping rigs into the country; others, noting a decline in work in other areas, began purchasing rigs for work in Illinois. Old cable-tool contractors from Pennsylvania, Kentucky, and West Virginia began arriving with their machines.

Because of their different sources, there was a wide range of equipment and practices introduced in the area. Rotaries once more vied with cable tools for the work as many of the independent operators and some of the supervisory personnel of the major companies were prejudiced in favor of the older method. Each was eventually fitted into its proper niche until now the drilling equipment and procedure used are well organized, with the rotary rigs being used to drill the major portion of the hole and set the pay string, and the cable tools being used to complete the hole, clean out after the shot and run the tubing and rods.

The rotary rigs can compete with the cable-tool rigs on a cost basis for drilling the upper part of the hole and they can do it much quicker. Where time is an essential factor, the rotary rig has the advantage. On wildcat wells cable tools are still widely used as they afford a means of testing stray sands that may be productive.

On the first tests drilled in the deep part of the basin, the cable-tool method was used and it was found that most of the Pennsylvanian and Chester sands contained water and the hole had to be underreamed with the pipe being carried close to the bit. The presence of the water-bearing sands is the principal obstacle to the cable-tool method, although the caving Pleistocene formations often give the drillers trouble when a hole is being started.

Both the cable-tool and rotary rigs have been redesigned, and in cases of purchase of new rigs, designed for the task at hand. Due to a shortage of available water for boilers, mechanically driven rigs have a distinct advantage in Illinois. There is also a shortage of gas in most of the fields and the purchase and hauling of fuel oil adds greatly to the expense of the contractor. Pure Oil Co. operates four steam rigs in the Clay City field but it has an extensive water and gas system for supplying lease requirements which also furnishes these essentials to the drilling equipment. These rigs were shipped in from Texas at the start of development, but they have been redesigned for work in Illinois and can be efficiently moved. They average drilling two 3,000-ft. wells per month.



Cable-tool machine used for completions of Illinois basin wells

Several contractors have steam rigs, but they also have been revamped since coming to Illinois and they have been able to operate, despite the obstacles, as efficiently as older mechanical rigs.

"Slim hole" drilling was introduced in the basin early in 1938 and the enlarged core drills are becoming increasingly more evident. These consist of one or two units, can be moved and rigged up in a surprisingly short time, and can generally operate cheaper than the ordinary rig. However, during the rainy season, they are handicapped almost as much as the rig that can be moved in pieces. Their principal advantage is that they do not require a derrick but furnish their own mast.

Equipment Scaled Down

Every effort has been made by the contractors to scale down their equipment as much as possible and still maintain its efficiency and safety. Drilling lines are seldom over 1 in. in diameter and often are ⅞ in. The reduction in size is a saving in initial cost and the smaller size wears better, particularly if the crown sheaves and traveling-block sheaves are small. The shallow depth does not require high pump pressures, the gage seldom showing over 450 lb. per sq. in., and mud lines and hoses can be lighter than those normally used.

The rigs having the advantage are those designed for use in Illinois with a maximum operating depth of 3,400 ft. Rigs of this type follow one of two designs: hoist and two engines unitized on one skid with a 12 or 14-in. stroke pump separately mounted, or hoist and one engine mounted as a unit and a 10 or 12-in. pump and its drive engine mounted as a second unit. Each of these rigs has some advantages. Older rigs are still being remodeled to fit into one of these classes although it is often hard to accomplish due to weight of the old-style hoists. The next best thing is to mount the two motors and reduction gear on one skid.

In order to meet the requirements of the state highway department, both width and length must be kept within certain limits. Some rigs have

(Continued on Page 66)

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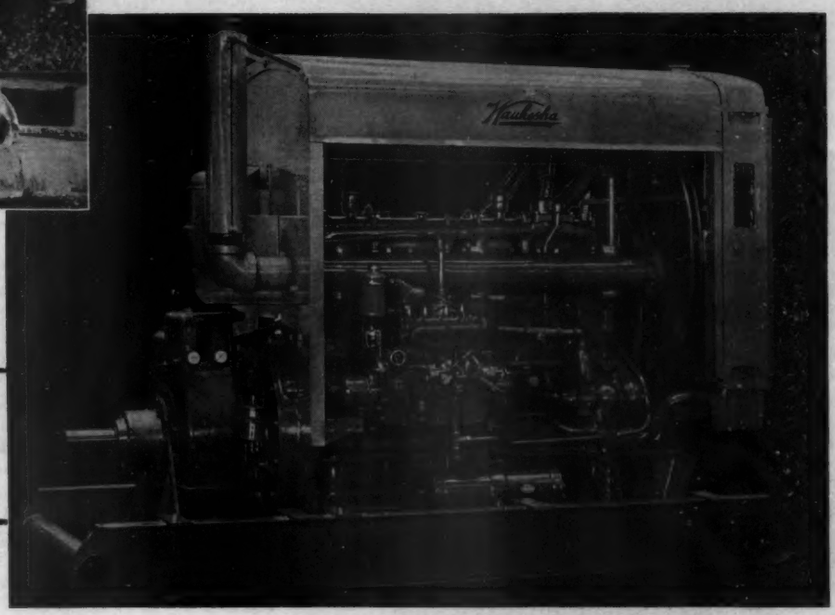

(*right*) Waukesha *Model 6-WAKU, 193-210 hp. gas drilling engine with* Twin Disc *Torque Converter and gasoline engine starting system. A complete self-contained power plant; no batteries, no generator, no electrical system to maintain.*

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Carter Oil Co. and Pure Oil Co. are the only major companies having a drilling department operated as part of the production department, although several independent companies have their own rigs. The largest of the independents is the Kingwood Oil Co., which owns four of the biggest rigs that are used mostly for wildcat drilling. One of these rigs drilled the deepest hole ever drilled in the state. The check on costs made by the company-owned rigs, together with the highly competitive situation, has led to a contract price that makes it difficult for the contractor to realize a profit unless his rigs are designed for work in the basin.

The price in Louden field varies from $2.25 to $2.50 per foot, in Salem from $2.50 to $3 per foot, and in the deeper areas from $3.50 to $4 per foot. In some cases the price is under or over the amounts quoted, the former price generally carrying with it some extra reimbursements while the latter generally includes some extra expense.

Larger companies generally furnish derrick, pits, water, and sometimes fuel, while the smaller companies often prefer that the contractor furnish these items. If the fuel (gas) is furnished, a contract can be taken for much less than when the contractor has to purchase diesel oil, gasoline, or butane. In addition to the fuel there are the usual costs of labor, bits, depreciation, supervision and transportation (the latter often amounting to a major portion of the contract price) which must be directly charged to the operation. The indirect charges due to investment and overhead must also be realized.

All of the costs vary widely with individual rigs and operators, fuel ranging from $20 to $40 per day, labor from $84 to $120, and bits per well from $234 to $1,092 in the same field. The transporttion costs probably have the widest range, some rigs being moved and rigged up for less than $100 during good weather and the same, or a similar, rig costing over $1,000 in extremely bad weather. However, the larger companies generally pay all over a certain moving cost. Drill pipe wears rapidly in the abrasive sands found in Illinois, 60,000 ft. being the life of a string of drill pipe and some condemning before that footage has been reached. The average new rig in the area costs from $35,000 to $40,000, including drill pipe. Several sizes of pipe are used, most rigs being equipped with 6⅝ or 5$\frac{9}{16}$-in. drill pipe for drilling surface hole, 4½-in. drill pipe for drilling most of the hole and several hundred feet of 3½-in. pipe for use in completing the well.

While not particularly hazardous, the Illinois area has a certain number of difficulties, including the unfavorable moving conditions, excessive wear on the drill pipe and sticking of the bit and drill stem. Little can be done about the former except to move only in good weather or by the erection of board roads. The wear on drill pipe is being combated by the use of hard metal circumferential strip on the tool joints, use of oversize tool joints, and a reduction in the speed of the rotary table and the amount of weight run on the bit. The hard metal strip is still in the experimental stage, although it has been found that the more expensive metals wear best but they also approach the price of new tool joints.

The most successful method of overcoming the trouble has been to increase the amount of drill collar use, and at the same time reduce the section of drill pipe in compression. Many contractors are using two drill collars and many are contemplating the addition of another pair of collars to their strings. Two drill collars give just about half enough weight to make the bit dig satisfactorily through the hard formation and the inclusion of another pair in the string will probably give the desired "plumb-bob" effect to the drill stem. The major drawback to this program is the tendency for the drill-collar section to break off and cause a difficult fishing job.

Slower rotating speeds have been found to have a penetration rate close to the rapid rates. Damage to the drill pipe is much less at slower speeds and some contractors feel it is more economical to sacrifice a few hours' time in the drilling of a hole.

The stuck drill stems continue to dog the drilling crews and as yet there has been no satisfactory solution to the problem. The drill pipe often becomes stuck while coming out of the hole, the Chester sands being particularly bad in this respect. Some credit the sticking to lack of sufficient pump pressure, some to the mud condition, some to drilling of the particular sand with a bit slightly out of gage and others to too-rapid rate of penetration while drilling the sands. Neither oil nor acid is particularly effective in getting loose. The drill stem is generally not too long to react to driving and this has been the method by which most strings have been freed. Some contractors prefer to drive with the kelly joint, while others use a weighted joint of casing.

Due to the shallowness of the wells, there is an interesting economic point in just how long a crew should fish. Some contractors prefer to keep trying, while others have resorted to cutting out and skidding the rig and drilling a completely new hole.

Another factor that has bothered the drilling crews has been the difference in the number of

Left upper: Mixing mud to regain lost circulation on Sandoval well. Center: Pipe rack shows three sizes of drill stem used by one rig. Lower: Portable drilling rig with pipe in mast. Below: Rotary rig with motors set normal to line shaft. Inset: One of the portable cable-tool machines ready to raise mast

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bits required to drill a hole. In some parts of one field holes can be drilled with three or four bits, while in other sections of the same field, 14 bits may be required. In the Keensburg townsite pool there is a streak on which wells required twice as many bits as wells drilled in other parts of the field. This may be expected in the Chester series as the producing zones indicate the deposition was governed by local conditions and the shale in one formation may be replaced by almost pure sandstone in some places; in other cases, an expected sand may be replaced by shale.

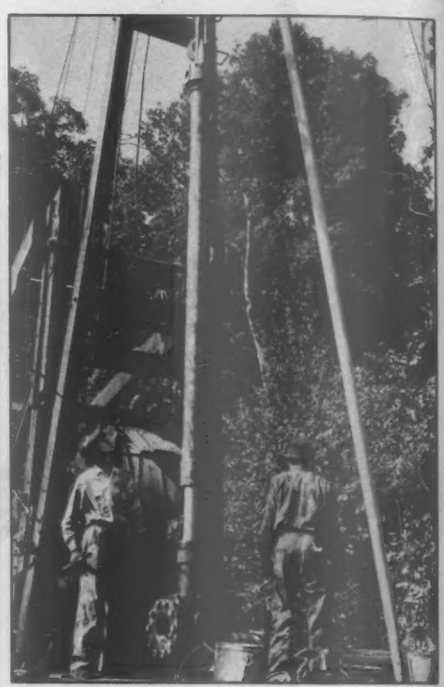
In general, the basin area presents few drilling problems beyond economical moving, fast rigging up, and the rapid drilling of the wells. Very few holes have drifted enough from vertical to cause plugging back, the hole generally stands up well, very little additives to the mud is required and circulation is seldom lost.

The most popular hole sizes at the present time are 8¾ in. and 7⅞ in., with an increasing tendency to drill more of the latter size. There are also some 7⅞ and 6¼-in. holes being drilled. Most of the rigs in the area are equipped with 4½-in. drill pipe which can best be used in the larger-size hole. On wearing out, much of the 4½-in. pipe is being replaced by the 3½-in. pipe and the drilling of a smaller hole. The 3½-in. drill pipe also operates best with multiple drill collars. Many holes are drilled without the use of surface casing, and this decreases the amount of equipment used and the time consumed per well.

Deeper drilling in the area may present a host of new problems as nearly all of the holes drilled to lower horizons by the rotary method have encountered considerable difficulties.

Cable tools are moved on the location as soon as the rotary rig has been dismantled. Most of the spudding machines have their own mast although some are operated inside the derricks. However, most contractors prefer to tear down the derrick as soon as the rotary has run the casing. The drilling of the plug and the pay require less than a day but the shooting and cleaning out of a well generally takes from 3 days to a week.

Some operators prefer to hire the spudding machines on a day basis while others want to contract the job, the general contract price amounting to about the same as 5 days' work for the machine. Machines may be hired for as little as $75 per day and as much as $125 per day, the differences being in the quality of the machines and the ability of the workmen. Generally, the better machines are more economical, despite the difference in price.



Putting lubricator over stem preparatory to drilling in with spudding machine

The sand wells in the area can often be completed without any equipment for the prevention of blowouts but most of the spudding machines are using lubricators as they are much safer and eliminate any danger of the well's getting out of control. In areas known to have little pressure, only a control head and an oil saver are used. The Devonian pay in the Sandoval field, drilled with cable tools because of its thin pay zone, gave the drillers some anxious moments, and since then precautions have been taken against similar occurrences while completing wells.

While the rotary rigs in the area have been improved, their improvement has not been as startling as the spudding machines. Most of the newer ones are models of efficiency, moving under their own power, hoisting their own masts without the aid of a truck, and quickly and easily doing the task assigned to them. They are also used extensively by the production departments for the pulling of rods and tubing and the repair of wells. No masts or derricks are required over the producing wells.

Winter may cause many of the rigs to shut down as most of the large companies have indicated they will not attempt to operate during the rainy season. This same statement was made in 1937 and again in 1938 and the past year found two of the major companies in the area being forced on all sides. The same may happen again this year with many wells being drilled by the independents offsetting major company lease blocks.

Instead of the usual single pawl, bearing against one gear tooth, The "Superector" provides increased bearing and strength by 2 pawls engaging 2 teeth for both ON and OFF rotation of nuts. All 4 pawls are of hardened tool steel, so designed as to provide pure crushing action on the pawls—the sturdiest construction possible, with no "back-lash."
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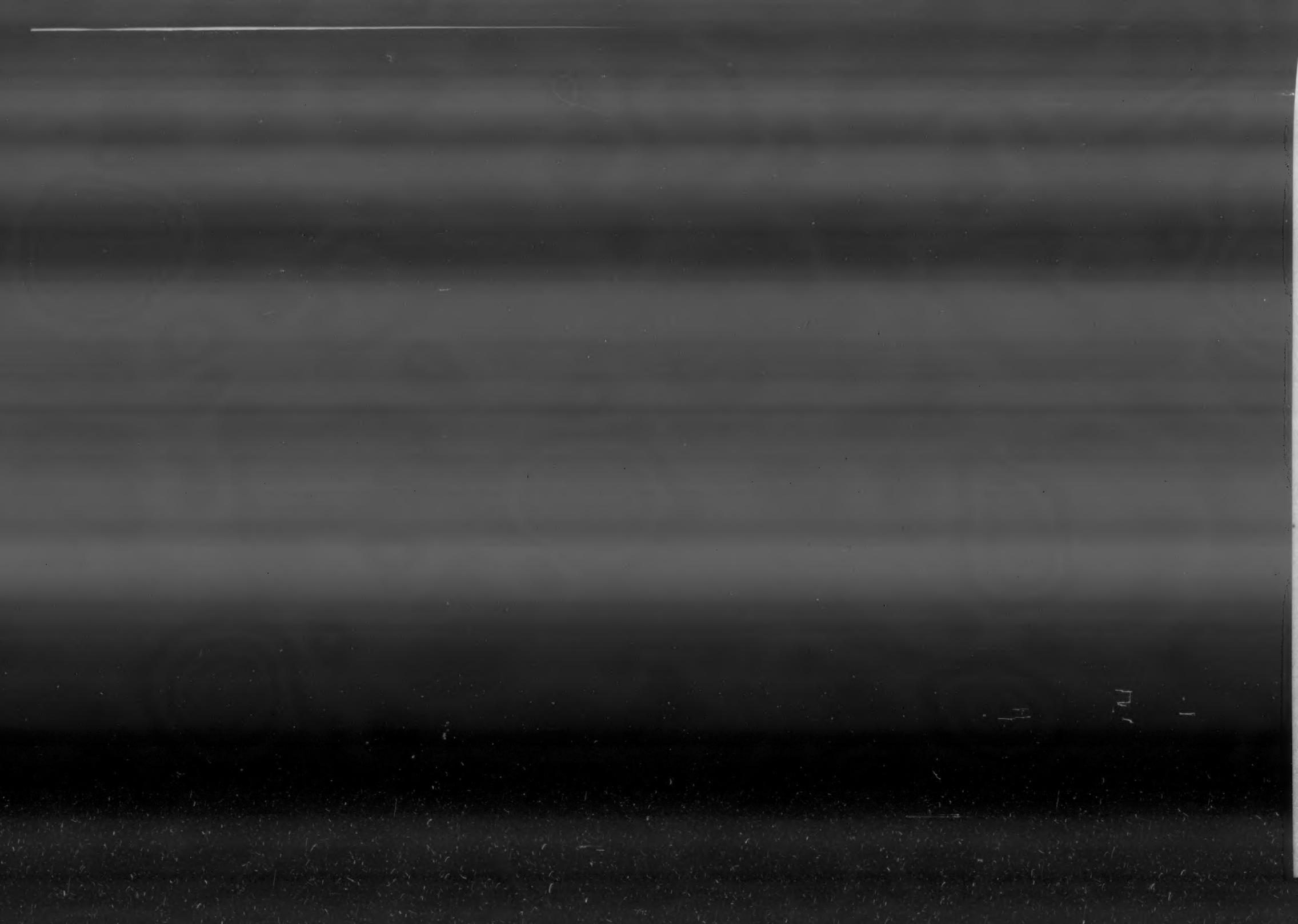
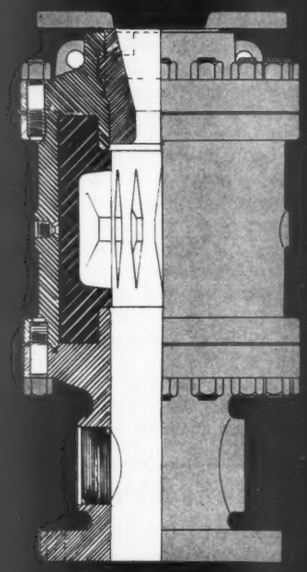
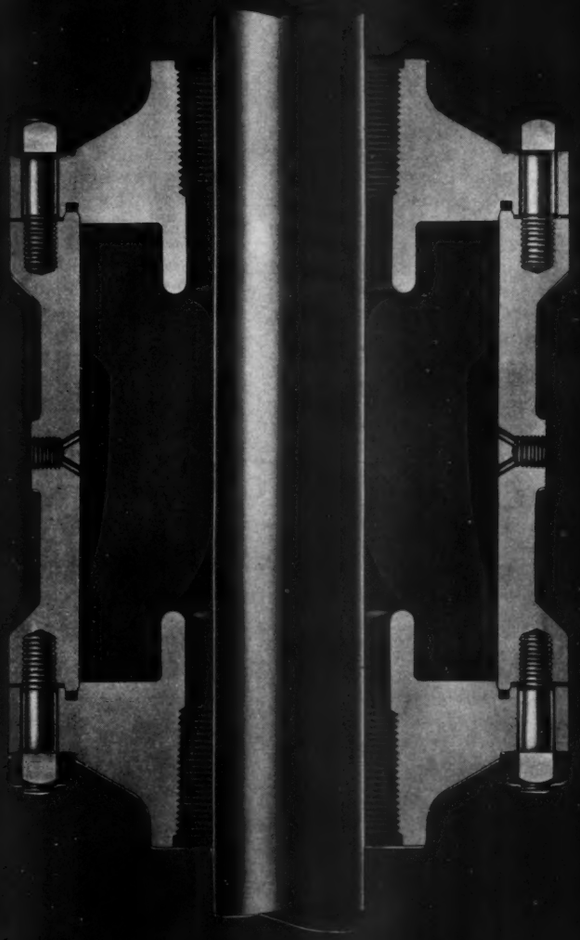


REGAN TYPE K BLOWOUT PREVENTER





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Six Horizons Producing Along Wabash Valley

(Continued from Page 56)

in the village of Keensburg. Thus far 45 wells and 4 dry holes have been completed in the W½ Section 9-2s-13w, and adjoining parts of Sections 8, 16 and 17. Average sand thickness has been 16 ft. and initial production has ranged from 50 to 650 bbl. per day. Three gathering systems and as many loading racks are serving this booming village. So far, 500 acres are proven.

Just east of the Griffin pool in Section 8-3s-13w, McClosky production has been found on both sides of a fault with 160 ft. of throw. This field is called the Heston area after the fee owner of the farm on which W. F. Lacy drilled the discovery well. Lacy's No. 1 Heston, W½ SW NE Section 8-3s-13w, located on the upthrow side of the fault, had an initial production of 312 bbl. of oil and 25 bbl. of salt water after being acidized with 1,500 gal. at 2,806-16 ft. The west offset, Tide Water's No. 1 Kelly, on the downthrow side of the fault, finally was completed, pumping 125 bbl. of oil and 10 bbl. of water after acidizing at 2,956-65 ft. The north offset to the discovery well was dry. This area is 4 months old. Development thus far has been very cautious, because McClosky-lime production that requires acidizing is a very uncertain proposition from the ultimate-recovery point of view.

Clyde Washburn's No. 1 Pfeifer, SW SW SW Section 13-1s-13w, was completed 3 months ago for a 48-bbl. well in the Tar Springs sand at 1,943-55 ft. This well was plugged back after testing dry McClosky. The original well is showing fine staying power, as between 40 and 60 bbl. per day are being trucked away. The oil is being used for fuel purposes in the Keensburg townsite boom. The southwest offset, Magnolia's No. 1 Wallace, NE cor. Section 23-1s-13w, has just been completed for an estimated 1,500 bbl. per day.

The Sun Oil Co. has two light wells producing from different horizons. These wells are 2 miles apart, but being located fairly close to Crossville, we have given them that name. The Sun Oil Co.'s No. 1 Ford, NW NE NE Section 18-5s-14w, is a 20-bbl. pumper from the McClosky at 2,998-3,009 ft. Sun Oil Co.'s No. 1 Garner, SW SE SW Section 1-5s-10e, was completed in the Aux Vases, topped at 2,934 ft. as a 125-bbl. pumper. This is the first Aux Vases production for the Wabash Valley, but not for White County. The Mill Shoals pool in northwestern White County has some fine wells in that horizon. The Sun Oil Co.'s Garner well has rapidly declined in the past 6 weeks to 29 bbl. per day swabbing, and the operators are now working the well over.

Edwards County, Illinois, got its first oil well when Kingwood Oil Co. completed its No. 1 Johnson, SE NE Section 18-3s-11e. This well was completed 3 weeks ago as a 45-bbl.-an-hour well naturally from the McClosky at 3,125-33 ft. The south offset, Kingwood's No. 1 Steele, is a 300-bbl. well. The east offset, Magnolia's No. 1 Meredith is a 125-bbl. pumper, and ¾ mile north, Kingwood's No. 1 Helm is an 80-bbl. well.

Last week Carter and others completed their No. 1 Johnston, NE SW NE Section 12-4s-10e, 1½ miles southwest of Calvin, for a 376-bbl. pumper from the McClosky at 3,184-93 ft. Between this well and the Grayville pool, 8 miles to the north, Kingwood Oil Co. has set pipe on McClosky saturation on two wildcats. Kingwood's No. 1 Metcalf, S½ N½ S½ Section 31-3s-11e, had saturated McClosky at 3,090-98 ft. and has landed 5½-in. casing at 3,205 ft. Kingwood's No. 1 Fearne, SE NW NW Section 19-3s-11e, had McClosky saturation from 3,164-76 ft. and 5½-in. pipe landed at 3,203 ft. Both wells are to be completed by gun-perforating. Gun-perforating McClosky completions is rapidly becoming standard practice in the Illinois basin.

Roger Lacy (formerly C. G. McFadden and Claude Bell) has completed a 300-bbl. Cypress-sand well at 2,627-41 ft. on the Charles Bump farm near the town of Cowling. Exact location is SE SE SW Section 34-2s-14w. Cypress sand was missing in wells located ¼ mile west, ½ mile south and ½ mile northeast, so any estimate as to the importance of this discovery must await further developments.

One of the most interesting completions in the Wabash Valley is the Eason Oil Co.'s No. 1 Storms heirs, C W½ SE SW Section 14-6s-9e, good for 12,500,000 cu. ft. of gas from Waltersburg sand at 2,209-44 ft. This well was plugged back after testing the McClosky dry, and is the first important gas found in any of the Chester sands along the Wabash Valley.

Summary of the October 1 scout report shows the following for the Wabash Valley: Drilling wells 65, of which 30 have the oil string set or are testing; derricks and rigging up 15, and locations 12. These figures are exclusive of the Keensburg townsite developments.

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LOW HEAD, forced draft cooling towers effect high savings in cool process water for refinery use. The reduction in pumping head, compared to natural-draft practise, is close to 60%. When pumping-power savings are credited to fan-power costs they pull down the overall expense of mechanical draft towers to the economic level of atmospheric towers. The first cost—for units of equal capacity—and year 'round performance definitely favor mechanical draft.

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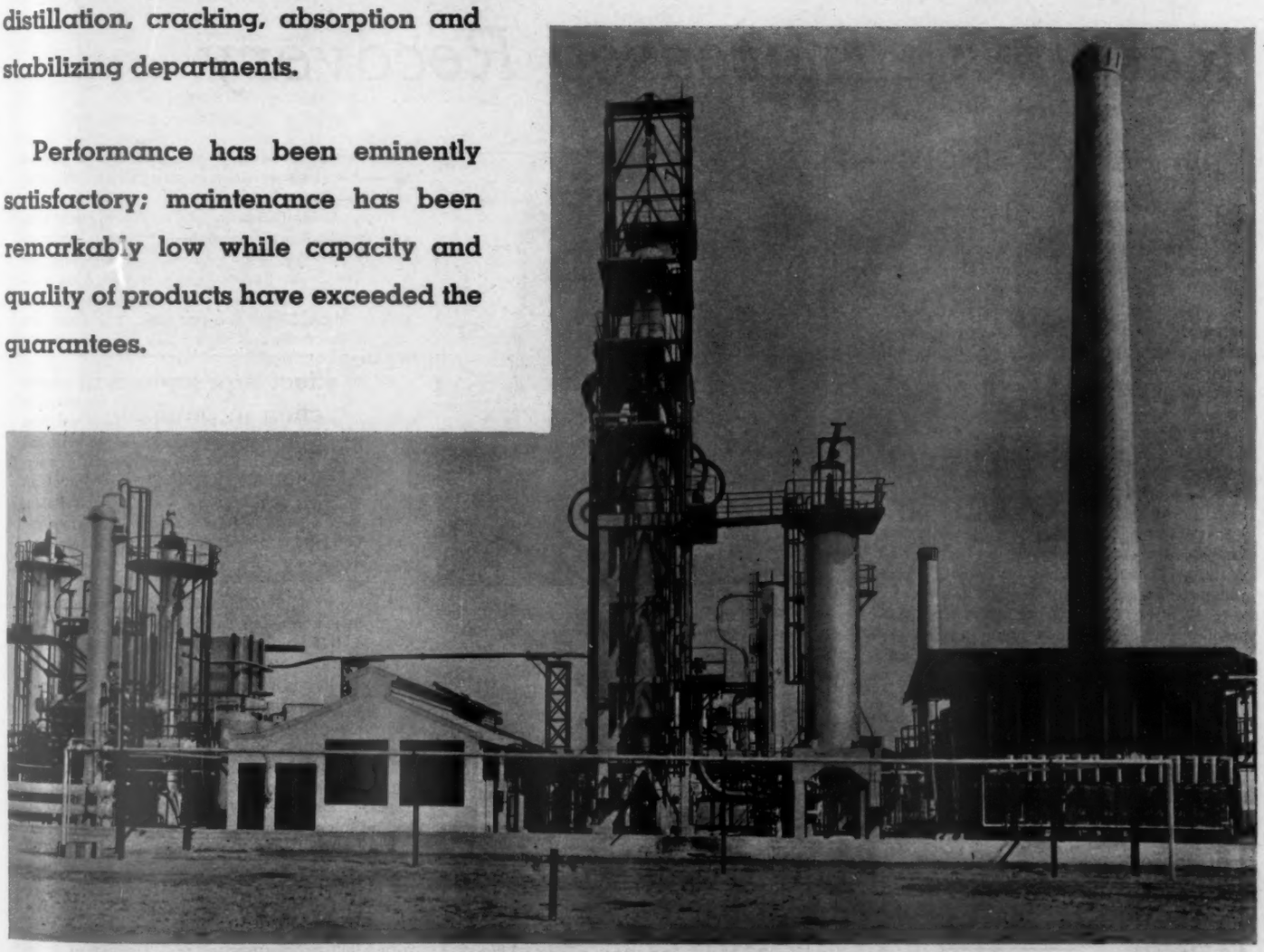

This photograph shows part of a refinery entirely designed and constructed by Foster Wheeler.

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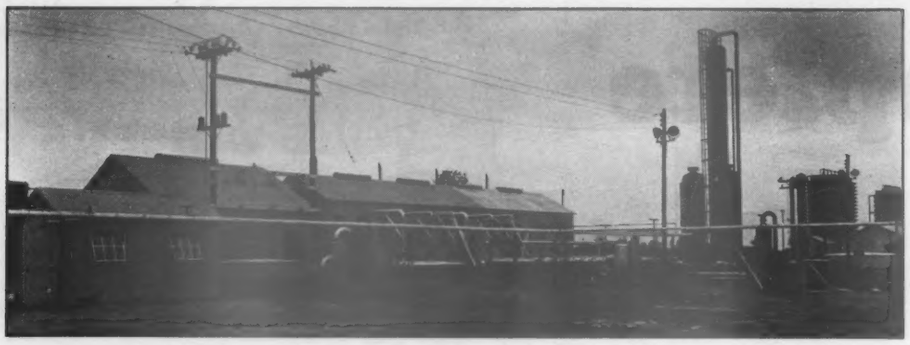


Repressure plant in Louden field was recently enlarged

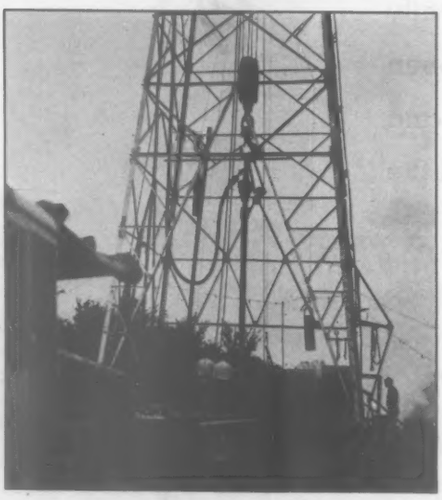
Voluntary Conservation in Illinois Results in Increased Recovery

By HARRY F. SIMONS

UNDER conditions exisiting in producing areas of the United States today the rate of production in oil fields generally is controlled by one of three methods: The administrative method, which involves state proration laws; agreements made between a number of lease owners; and voluntary restriction made necessary by the physical conditions found in the reservoir. That there is an optimum rate of production which will insure the ultimate maximum recovery has long been conceded by petroleum engineers. The production characteristics of various fields differ widely but it is extremely important that the driving force which propels the oil into the well bore be controlled at all times in the operation of both flowing and pumping properties.

In fields having considerable quantities of gas located within the reservoir, the production of gas in excessive amounts soon reduces the reservoir pressure and quantities of oil are irreparably lost. Fields having a good water drive will, if produced too fast, cause premature water encroachment and the isolation of oil in the producing sand, which is never recovered, and therefore wasted.

The optimum rate of production varies widely with different fields, but experience of the industry has shown that in the best fields production should rarely exceed 6 to 10 bbl. per acre per day. In most fields, it should seldom exceed 2 bbl. per acre per day. The latter rate is suitable to most of the Illinois producing areas although some of these should have even lesser rates of withdrawal.



Running electrical-logging device to obtain information for the determination of proper producing rate

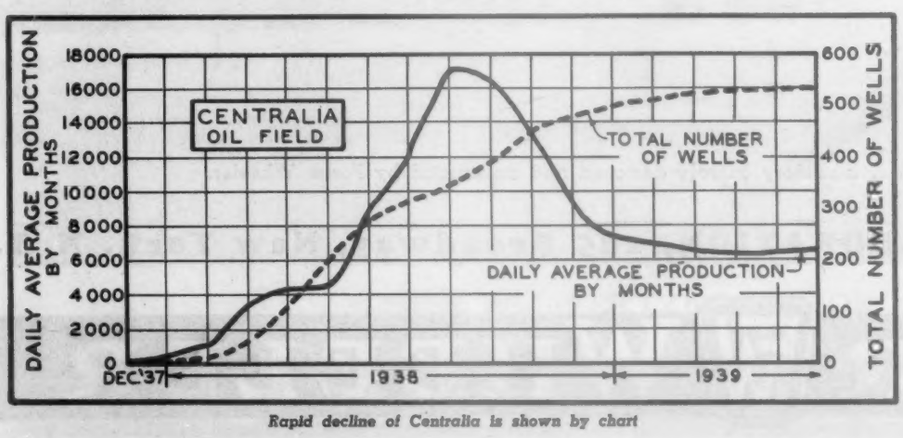
By producing fields at the optimum rate the total recovery will often exceed by 50 per cent the recovery from a similar field produced unrestricted and in a wasteful manner. Probably the outstanding example of the benefits of proper spacing and conservation of energy is in the Burbank and South Burbank fields of Oklahoma. The Burbank field, drilled on 10-acre spacing and less, and produced wide open, will have an ultimate recovery in the neighborhood of 10,000 bbl. per acre. The South Burbank pool, exploited on a 20-acre spacing and produced conservatively, will recover about 15,000 bbl. per acre. The fields are only a short distance apart and are practically similar in all respects.

At the present time the status of legal conservation in Illinois is very precarious as there is little agreement on the provisions of an act best suited to Illinois. Conservation by agreement has been only partially successful as, generally, operators cannot be brought together to control an area of any extent. In the Louden and Salem fields the two holders of the majority interest have found their production program blocked by lease owners eager to produce their properties to capacity.

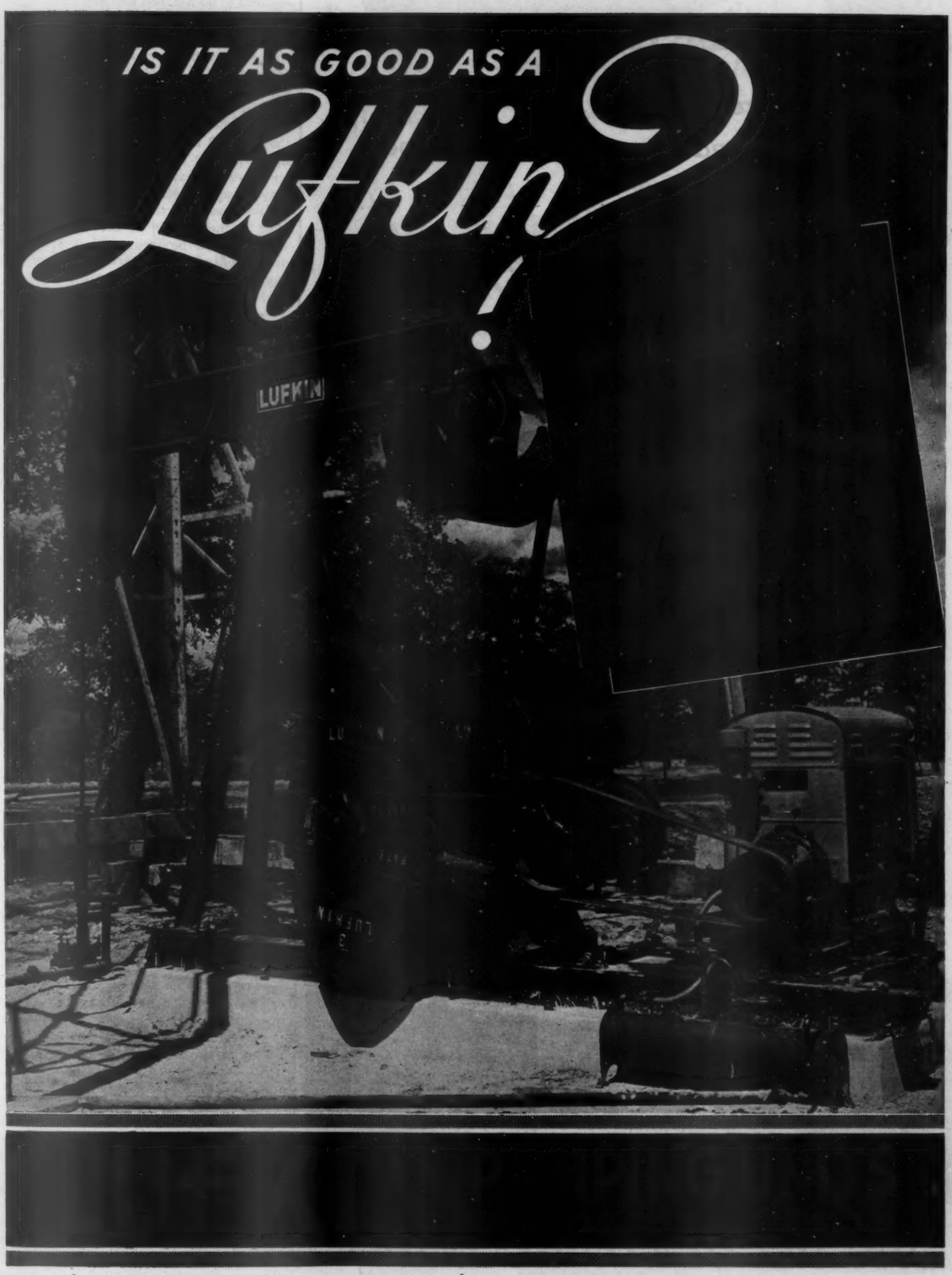
A good example of what may be accomplished by proper producing rates is found in the Dix pool in Jefferson County, Illinois. This pool is owned entirely by one company; contains 50 producing wells and covers approximately 1,000 acres. It has been restricted voluntarily since its discovery and is still capable of producing its initial daily production.

The field was discovered on December 31, 1937, by the completion of Carter Oil Co.'s No. 1 R. A. Tate, Section 10-1s-2e, Jefferson County. The well had an initial potential of 50 bbl. per day of 37½° gravity oil from the Bethel sand at 1,990 ft. The field was developed on a 20-acre sunflower spacing plan, 50 wells being drilled over a period of 18 months by one and sometimes two rotary rigs. The average initial potential of 242 bbl. per well with a bottom-hole pressure of 735 lb. per sq. in. at 9,375 ft. sub sea; gas-oil ratio is 250 cu. ft. per bbl.

The field had little gas energy available, and at one time repressuring with gas from the Salem field was considered, but it was discovered that the field had a reasonably good hydrostatic drive and control of the production rate would be sufficient to insure maximum recovery. In view of the reservoir conditions, it was decided to produce 50 bbl. per well, 2½ bbl. per acre per day, from the reservoir until the field indicated its proper rate of withdrawal. Bottom-hole tests were run periodically and on June 1939 the pres-



Rapid decline of Centralia is shown by chart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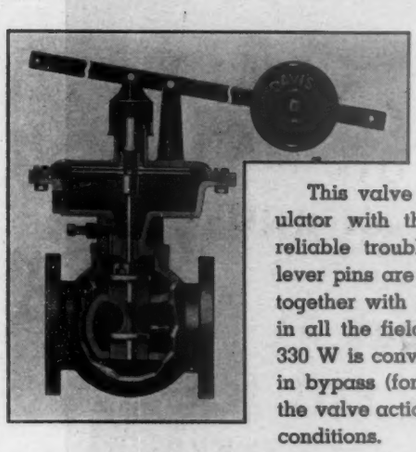
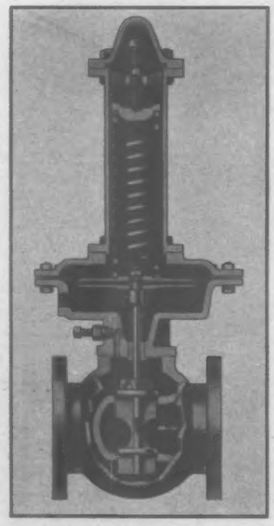


No. 330 W

This valve combines the sensitivity of a weight-loaded regulator with the patented weatherproof construction insuring reliable trouble-free service. Valve stem, stem bushing and lever pins are stainless steel to resist corrosion. These features together with its rugged construction have made it a favorite in all the fields. Merely by reversing the counter-weight, No. 330 W is convertible for either vacuum or back pressure. Built-in bypass (for throttling flow to diaphragm chamber) steadies the valve action and prevents vibration under severe operating conditions.

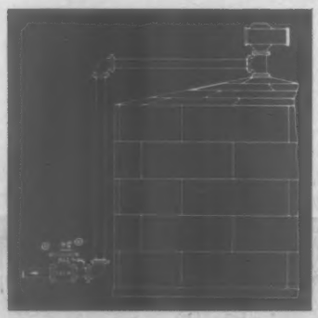
No. 331 S

This is Davis' new compact spring loaded valve for back pressure or vacuum service. It is ideal for remote outdoor locations because it is completely weatherproof and the spring cap can be readily sealed to prevent unauthorized resetting. Valves are regularly equipped with double spring — the heavier one being removed when the pressure is near atmosphere. Changing the spring loading from vacuum to back pressure, or vice versa, can be easily done in the field. Other construction features are same as No. 330 W. For complete description, ask for Davis Bulletin No. G-1.



No. 335 W

This supersensitive gas relief valve is recommended for use on vapor recovery systems. Relieves gas from field batteries and reservoirs into suction line of gas gathering systems. Fully described in Bulletin G1.



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sure had dropped to 435 lb. sq. in. It was thus evident that the withdrawal rate was slightly in excess of the rate of encroachment of the water and the production from the field was voluntarily reduced to 40 bbl. per well per day.

Early in September 1939 another survey of the bottom-hole pressure in the wells showed that the pressure had increased to 460 lb. per sq. in., indicating the maximum rate of withdrawal should be somewhere between 40 and 50 bbl. per day per well for this field. At this rate of withdrawal, the water level will gradually rise and the most oil in place may be recovered from the upper part of the sand. As wells lower on the structure increase their water production they may be squeeze-cemented or, in cases where corrective measures fail, they may be abandoned. Most of the oil will be driven up the structure where it will be recovered. The rate of withdrawal will probably continue to be at 40 bbl. per day throughout the life of the field, 15 to 20 years, unless future tests develop information which may require readjustments in the producing rate.

In direct contrast is the new Centralia oil field, also a 1937 discovery. The first well in the area, Adams Oil & Gas Co.'s No. 1 Schmidt, Section 2-1n-1w, made an initial of 161 bbl. when it was completed in November 1937. Production in the field has been mostly from Benoist sand which averaged from 10 to 40 ft. in thickness; the average depth of the producing wells has been 1,370 ft., average initial 150 bbl. daily; gravity is 35.5°.

Development of the field was quite rapid, and one of the wildest drilling campaigns ever experienced in Illinois was retarded only by the adverse weather conditions. In 8 months over 330 wells were drilled and a peak production of slightly over 17,000 bbl. a day was reached. While the drilling of new wells continued, the field began to decline, due to its being produced at a maximum rate. At the present time there are 537 wells on production, making a total of 6,016 bbl. daily from the field, an average of slightly over 11 bbl. per well.

The excessive decline of production, with rapidly increasing lifting costs, influences the abandonment of a well; this has been the cause of many millions of barrels of oil being left in the ground.

A case of voluntary conservation is to be found in the north end of the Louden field in Fayette County. On the other hand the south end of the same pool which has been closely drilled and competitively produced, at the present time shows the effect of a high rate of production.

The Louden field was discovered late in 1937 by the completion of the No. 1 Mary Miller in Section 12-8n-3e. Development of the field was slow for a time but since last summer drilling development has been rapid. The north end of the field has been drilled mostly on the 20-acre sunflower spacing pattern, and the wells produced at rates varying from 30 to 40 bbl. per day, depending upon the local sand conditions. The initial bottom-hole pressure in the area was 650 lb. per sq. in.; it is now 536 lb. per sq. in.; this is a decline of only 114 lb. in more than 2 years since the field's discovery. At the present time wells in the north end of the field could produce as much as the average initial, which was 275 bbl. per well.

In the south end of the pool, sand and reservoir conditions were almost identical to those in the north end but close spacing and high rates of production were followed by the operators. Present bottom-hole pressure in the area is 150 lb. per sq. in., the wells are handling high volumes of water and practically all of them are producing their maximum capacity. Many of these wells cannot make as much as the production allotted to wells in the north end of the field. The ultimate recovery per acre in the north end of the field will probably exceed the recovery in the south end by 25 to 50 per cent.

CINCINNATI Reds
1939 SEASON
Games Won 97
Games Lost 57
Batting Average 278
Fielding Average 975
NEW YORK Yankees
1939 SEASON
Games Won 106
Games Lost 45
Batting Average 287
Fielding Average 978
WORLD CHAMPIONS 1939

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Basin Shows Increase

(Continued from Page 51)

The location of the new fields opens a wide territory for further prospecting and indicates that for the next several years new fields will continue to be found in excess of expectations of last year. A glance at the map of the new fields in Illinois reveals a group of fields extending through Wabash, White, and Edwards counties and another group of fields extending through Marion, Jefferson, and Franklin counties. The Central basin area has been extended southward by Mill Shoals and Springerton fields, while the Stewardson field in Shelby County has extended the productive territory to the north. This has led some operators in the area to feel that a ring of pools around the basin will eventually be established.

The addition to the reserve of the area by the new discoveries cannot be completely gaged at the present time, as not enough wells have been drilled to outline the producing horizon. Estimating the size of pools prducing from the Chester sands or the McClosky lime is very difficult, due to the local sand conditions, which often cause discontinuity of producing zones on a structure.

Major Companies Dominate

That the major companies dominate the Illinois situation is evident from a study of the production record and the ownership of undeveloped leases. Following is a table of the companies outstanding in the basin:

	Number wells	Dy. av. prod.
Adams Oil & Gas: Centralia	62	870
Patoka	66	1,218
Total	128	2,088
W. C. McBride: Centralia	16	294
Louden	18	783
Salem	19	9,514
Total	53	10,591
Gulf: Centralia	22	433
Flora	2	64
Louden	2	150
Noble	2	26
St. James	2	76
Whittington	1	30
Total	31	2,867
Carter: Centralia	2	32
Dix	49	1,183
Louden	615	29,883
Noble	4	69
Total	670	31,137
Shell: Centralia	64	1,242
Cordes	18	604
Louden	23	1,557
Salem	50	14,861
Total	155	18,464
Magnolia: Cordes	24	654
Louden	41	1,219
Marco	1	45
Roaches	3	144
Salem	183	33,163
Total	252	35,225
Ohio: Cordes	1	69
Noble	14	324
North Noble	1	15
Salem	60	8,846
St. James	6	162
Total	82	9,416
Kingwood Oil: Flora	6	145
Salem	20	9,191
Total	26	9,336
Continental Oil: Griffin	3	48
Deep Rock: Louden	1	18
Superior: Salem	3	35
Tide Water: Salem	5	605
Texas Co.: Aden	4	160
North Aden	18	690
Louden	21	1,417
Olney	14	246
Salem	726	81,504
St. James	16	501
Total	799	84,518
Pure: North Aden	2	83
Boyleston	1	26
Cisne	50	2,261
Clay City	296	21,412
Enterprise	21	2,141
Noble	95	1,525
North Noble	41	2,017
Total	506	29,465
Independents: North Aden	31	1,281
Barnhill	20	5,686
Boyleston	14	673
Centralia	371	3,145
Clay City	38	1,095
Cordes	10	352
Enterprise	4	263
Griffin	13	463
Leach	5	480
Louden	327	21,451
Mill Shoals	4	205
Noble	16	60
North Noble	7	270
South Noble	10	271
Olney	21	469
Patoka	34	316
Roaches	1	27
Salem	154	27,376
St. James	19	612
Tonti	16	1,763
Total	1,115	66,258
Others	5	115
Grand total	3,834	300,186

From the table it can be seen that 11 companies with 2,513 wells control 6,525,000 bbl. production monthly with six companies controlling the bulk of that amount. Three independent producers stand out, one of these, Kingwood Oil Co. has an extensive spread of leases and has been one of the most active prospectors in the basin, drilling more than 60 wildcats since the start of the play. W. C. McBride, Inc., is a producer of long standing in Illinois, having properties in the Lawrenceville field while Adams Oil & Gas Co. is one of the pioneers in recent Illinois development with large holdings in Patoka and Centralia.

Pipe Lines and Markets

For refiners, located in the central refining district, to turn their backs on the Illinois production would be unthinkable. Their anxiety to get this crude at its low price and with a saving on

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the transportation costs has led to an ever-increasing market for basin-produced crude. The price in Illinois has steadily declined since the discovery of Centralia, from $1.35 to the present price of $1.05 in most fields, with the newer development on the eastern side of the state obtaining 85 cents for lime production and 95 cents for sand production.

Most of the Illinois crude goes to major refiners located in Illinois, Indiana and Ohio. This is oil produced by integrated companies or oil purchased by Sohio Corp., the largest general purchaser in the state. In addition, numerous crude buyers have entered the state to obtain oil for independent refiners in the vicinity and for the many new plants that have been erected in the basin during the past 2 years.

The importance of the new pipe lines built during the past year cannot be overestimated as it would have been impossible for the state to reach its present heights without these new carriers. It is also significant that the abrupt rise in Illi-

Close drilling in Sandoval field. One rig was fighting lost circulation and other other was preparing to run electrical-logging device

nois production during the late summer and early fall months was due mostly to the increase in pipe-line capacity which released a stock of stored oil.

The future of Illinois appears to be as bright now as it was a year ago when Salem and Louden were being opened. The immediate play has swung from the western side of the basin to the eastern side and gives indications of some promising results to the southward. In addition, many companies have had numerous seismograph surveys made and have checked them with core-drill work. Some important new discoveries may be expected as it is illogical to believe that the major fields existing in the basin should have been found during the first 2 years of prospecting. Leasing has been active to the north and west of the present field along the DuQuoin anticline and development in this direction is indicated.

Indiana will probably see its most active year since the drilling of the old Devonian fields along its western side. Kentucky will remain the same, an enigma to the major companies, as drilling in that state has failed to develop an outstanding pool during the present year. Because of the difficulty of obtaining subsurface information, the major companies and larger independents are withdrawing from the area and leaving the field to old Kentucky operators who drill and pray for the best.

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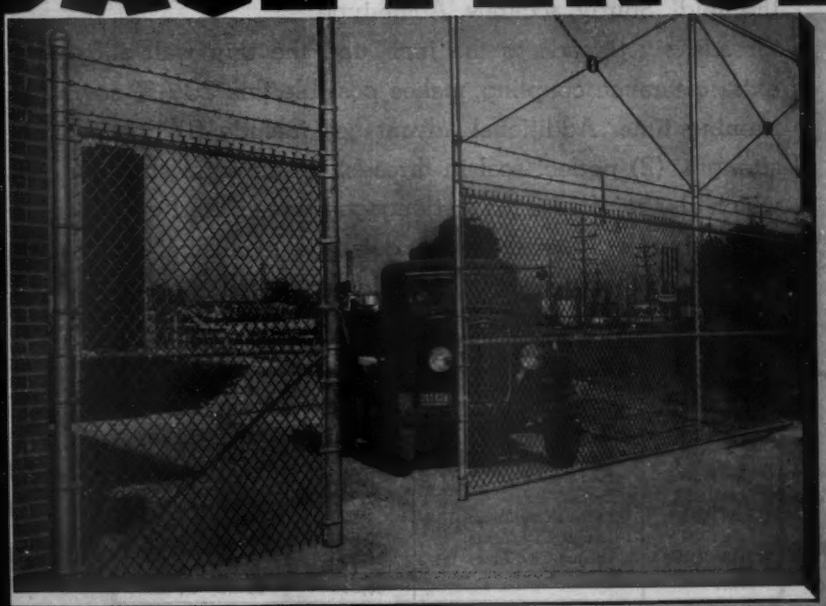

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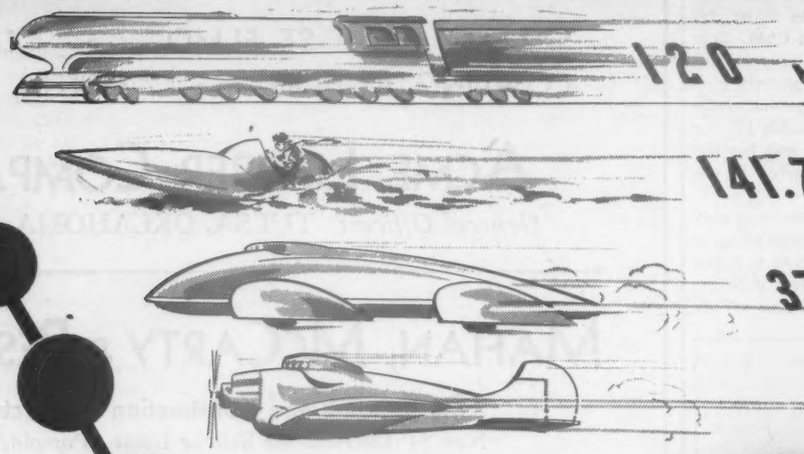

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TYPICAL PERFORMANCE RECORDS—PITTSBURGH SPECIAL ACME-THREAD CASING

DATE	LOCATION	NO. FEET	NET RUNNING TIME
Sept. 1938	Bay City, Texas	8,300	5 hrs.—42 min.
Dec. 1938	Tucker, Texas	5,500	2 hrs.—20 min.
Jan. 1939	Dickinson, Texas	8,455	5 hrs.—25 min.
March 1939	Plaquemine, Louisiana	9,000	6 hrs.
June 1939	Eureka, Texas	7,800	5 hrs.
July 1939	League City, Texas	9,526	6 hrs.
July 1939	League City, Texas	9,549	6 hrs.
Sept. 1939	League City, Texas	10,200	6 hrs.
TOTAL		68,330	42 hrs.—27 min.

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Refining Characteristics of

Illinois Basin Crude Oils

By GUSTAV EGLOFF,
G. B. ZIMMERMAN,
and J. C. MORRELL
Universal Oil Products Co.

A YEAR ago the authors presented here a collation of refining characteristics of Illinois crude oils. At that time, the Illinois oil field was heralded as again approaching the peak daily production rate of 92,291 bbl. per day achieved in 1908. Today, instead of following the decline of 1909, the Illinois fields have continued to grow phenomenally, reaching an average daily production rate of 330,966 bbl. in the week ending September 23, 1939. It is expected that by early 1940 the daily production will exceed 400,000. This rapid growth is largely due to the development of the Salem pool in Marion County which alone accounted for 200,074 bbl. per day of the September 23 production. The Louden pool in Fayette County produced 63,110 bbl. per day while the others totaled 67,782 bbl. per day. The daily oil production represents 8.5 per cent of the total for the United States.

To extend the work reported in 1938, additional analyses and cracking tests have been made on oils from several pools which have become important during the past year.

Tests were made on a 36.7° A.P.I. gravity Salem crude using combined topping and cracking of the crude in a single unit for the production of blended cracked and straightrun gasoline, low-cold-test furnace distillate and railroad-grade fuel oil. Table 1 gives detailed properties of this oil.

In order to complete the inspection of the crude oil, a laboratory fractionation was made to produce 400° F. end-point gasoline and a distillate fraction comparable to A.S.T.M. grade No. 2 furnace oil. The yields and properties of the overhead distillates as well as the corresponding topped and reduced crudes are reported in Table 2.

By simple fractionation of the crude oil, 35.7 per cent of 53.3 A.S.T.M. octane-number gasoline, 25.6 per cent of No. 2 furnace distillate with a cold test of 0° F. and 38.4 per cent of residual fuel oil was obtained.

The results of the operation on cracking are shown in Table 3, with 62.7 per cent of 64-octane gasoline, 14.3 per cent of No. 2 furnace distillate and 19.7 per cent of residual fuel oil of Grade 6 quality. The furnace distillate shows a cold test of 35° F. below zero as contrasted with a zero cold test for the corresponding straightrun fraction. Its cetane rating, estimated from the diesel index number, is 40. The yield of this fraction may be increased considerably with reduction in gasoline and fuel-oil yield. Changes in characteristics of the products will accompany these changes in yields. The gas from the pilot plant contains pentanes equivalent to 0.6 per cent of the charge which may be recovered as absorption gasoline. In addition the propene and butenes may be recovered as polymer gasoline through the use of a catalytic polymerization unit. This gasoline will represent approximately 1.6 per cent of the crude. Combining the polymer and absorption gasoline with the cracked-straightrun blend will increase the gasoline yield to 64.9 per cent and raise its A.S.T.M. octane rating to 65.

To produce gasoline marketable as a regular grade product, sweetening and the addition of tetraethyl lead and an inhibitor are required. Table 4 presents the results of sweetening by both the conventional doctor treatment and by U.O.P. copper sweetening preceded by a wash with 5 per cent by volume of 10 per cent sulfuric acid. These results show that by these sweetening treatments and the addition of up to 3.0 cc. of tetraethyl lead per gallon and small amounts of U.O.P. inhibitor, a stable, sweet gasoline having up to 75 octane number may be obtained.

In another set of tests, Illinois pipe-line crude of 38.4 A.P.I. gravity was topped to remove straightrun gasoline and kerosene. These products may be sold as third-grade gasoline and commercial kerosene. The reduced crude was then cracked to make a regular-grade unleaded gasoline and a railroad-grade (No. 6) fuel oil. Table 5 shows the properties of this oil.

The crude oil was fractionated in the laboratory to produce a 250° F. end-point light gasoline fraction, a 400° F. end-point gasoline, 250-400° F.

TABLE 1—PROPERTIES OF SALEM CRUDE

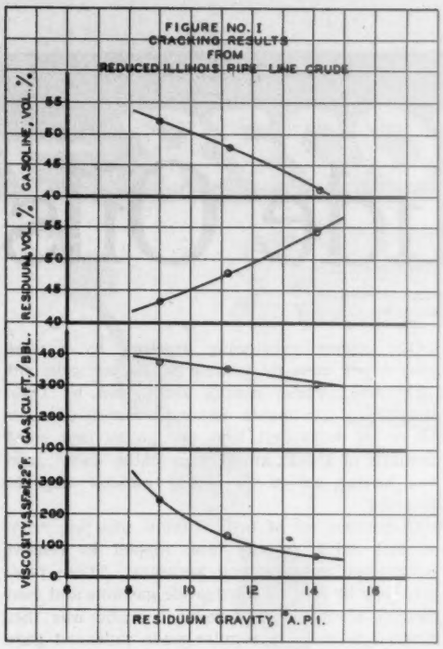
Gravity, °A.P.I.	36.7
Sulfur, per cent	0.24
B.s. and w., per cent	0.1
Cold test, °F.	—30
Salt as sodium chloride, lb./1,000 bbl.	113
100 cc. distillation:	
Initial boiling point, °F.	132
5 per cent	194
10	234
20	299
30	373
40	458
50	554
60	631
70	695
80	722
90	735
End point, °F.	735
Per cent over	97.0
Per cent coke by weight	2.7
Per cent at 400° F.	33.0
Per cent at 572° F.	53.0

TABLE 2—LABORATORY FRACTIONATION OF SALEM CRUDE OIL

Breakup No.—	1	2
Yields, volume per cent of crude:		
Gasoline	35.7	35.7
Furnace distillate	....	25.6
Topped crude	64.0	....
Reduced crude	....	38.4
Water	0.1	0.1
Recovery	99.8	99.8
Loss	0.2	0.2
	Gasoline	Furnace distillate
Properties of distillate fractions:		
Gravity, °A.P.I.	58.2	36.4
Mercaptan sulfur, per cent	0.024	....
Total sulfur, per cent	0.06	0.13
Vapor pressure, Reid, lb.	5.9	....
Octane No., motor method	53.5	....
Kinematic viscosity at 100° F., cts.	....	3.13
Universal viscosity at 100° F., sec.	....	36.4
B.s. and w., per cent	....	0.0
Cold test, °F.	....	0
Pensky-Martens flash, °F.	....	205
Conradson carbon (on 10 per cent residuum), per cent	....	0.05
Characterization factor	11.99	11.78
100 cc. distillation:		
Initial boiling point, °F.	115	436
5 per cent	154	454
10	172	460
20	199	470
30	220	483
40	239	497
50	257	515
60	278	530
70	290	550
80	321	569
90	348	596
End point, °F.	400	644
Per cent over	98.5	99.0
Per cent bottoms	1.0	1.0
Per cent loss	0.5	....
Per cent at 572° F.	....	81.5
Breakup No.—	1	2
Fractions removed:	Gasoline	Furnace distillate
	Topped crude	Reduced crude
Properties of bottoms:		
Gravity, °A.P.I.	27.2	21.5
Sulfur, per cent	0.30	0.40
Kinematic viscosity at 100° F., cts.	26.5	....
Kinematic viscosity at 210° F., cts.	....	18.1
Universal viscosity at 100° F., sec.	125	....
Universal viscosity at 210° F., sec.	....	89.6
B.s. and w., per cent	0.3	0.3
Cold test, °F.	20	70
Pensky-Martens flash, °F.	235	400
Characterization factor	11.9	11.9
100 cc. distillation:		
Initial boiling point, °F.	444	652
5 per cent	482	672
10	503	690
20	540	701
30	592	709
40	638	716
50	686	722
60	716	727
70	731	734
80	743	740
90	757	751
End point, °F.	760+	751
Per cent over	96.0	94.0
Per cent coke by weight	3.8	6.0
Per cent at 572° F.	26.0	....

TABLE 4—TREATMENT OF GASOLINE FROM SALEM CRUDE

Treatment:	None	Doctor sweetened	U.O.P. copper-sweetened with prewash
Properties of gasolines:			
Gravity, °A.P.I.	59.1	59.1	59.0
Mercaptan sulfur, per cent	0.025	.....	.....
Total sulfur, per cent	0.08	0.07	0.08
Doctor test	Pos.	Neg.	Neg.
Color, degrees Saybolt	3	.....	.....
Peroxide number	0.22	.....	.....
Organic nitrogen, per cent	0.0006	.....	.....
Gums, copper dish, mg./100 cc.:			
Without inhibitor	22	71	80
With 0.025 per cent U.O.P. No. 1	.....	7	32
With 0.0025 per cent U.O.P. No. 4	.....	12	20
Induction period, minutes:			
Without inhibitor	270	235	285
With 0.25 per cent U.O.P. No. 1	.....	410	415
With 0.0025 per cent U.O.P. No. 4	.....	390	375
Octane number, motor method:			
Without lead	64	62	62.5
With TEL, 1 cc./gal.	.....	69	.....
With TEL, 2 cc./gal.	.....	73	.....
With TEL, 3 cc./gal.	.....	75	.....
Octane number, L-3 method:			
Without lead	65	63	63.5
With TEL, 1 cc./gal.	.....	70.5	.....
With TEL, 2 cc./gal.	.....	74.5	.....
With TEL, 3 cc./gal.	.....	76.5	.....
Vapor pressure, Reid, lb./sq. in.	9.1	8.7	8.4
100-cc. distillation:			
Initial boiling point, °F.	105	107	103
10 per cent	155	159	153
50	262	262	260
90	368	368	363
End point, °F.	403	403	402



naphtha, and 525° F. end-point kerosene. The yields and properties of the distillate fractions are reported in Table 6 together with the properties of the topped and reduced crude bottoms. By this method 37.3 per cent of 54-octane number gasoline (400° end point) and 9.7 per cent kerosene may be obtained leaving 52.5 per cent of 24.6° A.P.I. gravity reduced crude saleable as a residual fuel oil or suitable as a cracking stock.

Cracking of the reduced crude was carried out on a 24.4° A.P.I. gravity stock obtained in semi-commercial fractionation of the pipe-line crude, producing gasoline and various grades of residual fuel oils. Gasoline yields of 41.2 per cent to 52.3 per cent were obtained having octane ratings of 68 to 69.5 while producing residues of 70 to 244 seconds Furol viscosity at 122° F., all of which meet the requirements for A.S.T.M. No. 6 fuel oil. Detailed results are given in Table 7 and are shown graphically in Fig. 1.

In addition to the gasoline recovered directly from the cracking-unit stabilizer additional absorption gasoline may be recovered from the receiver and the stabilizer gas. The propene and butenes contained in these gases may be converted to polymer gasoline by catalytic polymerization. Table 8 shows a detailed analysis of the gas produced during the second test. It is estimated on the basis of this analysis that from 0.6 to 0.7 per cent additional gasoline may be recovered by absorption and that through polymerization from 2.5 to 3.0 per cent of high-octane blending gasoline will be produced. The overall yields will thus be increased by 3.1 to 3.7 per cent with an increase of approximately 1.5 points in octane rating.

Like the product from the Salem crude, a marketable gasoline may be readily obtained by sweetening and inhibiting. Table 9 shows the properties of the finished gasoline without the addition of polymer. A higher-octane-rating gasoline may be produced at a slight sacrifice in yield by adjustment of cracking conditions.

Basing cracking yields on the crude oil, the overall results for the topping and cracking operation show 37.3 per cent straightrun gasoline of 54-octane number, 9.7 per cent kerosene, 29.4 per cent of cracked-polymer gasoline blend of 70.5 octane rating and 22.7 per cent No. 6 fuel oil.

Louden Crude Oil*

The Louden pool, discovered late in 1937, is now ranked second to Salem in production and reserves. A composite sample from the two pro-

(Continued on Page 86—Tables on Page 84)

*Appreciation is here extended to Dr. Cary Wagner of Pure Oil Co. for supplying the data on the Louden crude oil.

TABLE 6—LABORATORY FRACTIONATION OF ILLINOIS PIPE-LINE CRUDE

Breakup number:	1	2	3
Light gasoline (250° F. end point)	16.0	16.0	.....
Naphtha	.....	21.3	.....
Gasoline (400° F. end point)	.....	.....	37.3
Kerosene	.....	.....	9.7
Topped crude	83.5	62.2	.....
Reduced crude	.....	.....	52.5
Recovery	99.5	99.5	99.5
Loss	0.5	0.5	0.5
Properties of distillate:	**Gasoline**	**Naphtha**	**Kerosene**
Fractions:	250° F. end point	400° F. end point	250-400° F.	400-525° F.
Gravity, °A.P.I.	75.4	61.1	51.5	41.8
Vapor pressure, Reid, lb.	14.0	9.0	.....	.....
Sulfur, per cent	0.02	0.03	0.03	0.03
Kinematic viscosity at 100° F., centipoises	.....	.....	.....	1.73
Universal viscosity at 100° F., seconds	.....	.....	.....	31.3
Octane number, motor method	70	54	40.5	.....
Characterization factor	12.48	12.12	11.88	11.85
100-cc. distillation:				
Initial boiling point, °F.	86	103	252	397
5 per cent	101	137	264	415
10	109	154	269	419
20	127	185	278	424
30	143	211	288	430
40	155	233	298	435
50	166	253	309	441
60	175	276	322	448
70	187	299	337	455
80	204	326	352	464
90	225	359	373	489
End point, °F.	253	403	409	524
Per cent over	97.5	98.5	99.0	99.0
Per cent bottoms	1.0	1.0	1.0	1.0
Per cent loss	1.5	0.5	.....	.....

Properties of crude bottoms:	Topped crude		Reduced crude
Distillate fraction removed, end point, °F.:	250	400	525
Gravity, °A.P.I.	32.5	27.0	24.6
Pensky-Martens flash, °F.	.....	210	270
Sulfur, per cent	.....	0.25	0.28
B.s. and w., per cent	0.2	0.2	0.2
Cold test, °F.	20	50	60
Kinematic viscosity at 100° F., centipoises	7.90	29.7	.....
Universal viscosity at 100° F., seconds	52.0	140	.....
Kinematic viscosity at 210° F., centipoises	.....	.....	8.07
Universal viscosity at 210° F., seconds	.....	.....	52.2
Characterization factor	11.95	11.90	11.95
100-cc. distillation:			
Initial boiling point, °F.	278	448	540
5 per cent	321	480	565
10	356	500	581
30	497	582	648
40	560	640	679
50	631	681	696
70	694	721	721
80	718	734	734
90	730	747	750
End point, °F.	752	755	760+
Per cent over	97.0	96.0	94.5
Per cent coke by weight	3.1	4.4	5.4
Per cent at 400° F.	19.0	.....	.....
Per cent at 437° F.	23.0	.....	.....
Per cent at 572° F.	43.0	27.0	7.0

TABLE 11—LABORATORY YIELDS FROM LOUDEN CRUDE OIL, FAYETTE COUNTY, 38.0° A.P.I. GRAVITY

Fraction:	Gasoline 350° F. end point	Naphtha 350° to 420° F.	Gasoline 420° F. end point	Kerosene distillate	Gas oil	Wax distillate	Bottoms
Yield, volume per cent of crude oil	29.7	7.0	36.7	8.0	10.0	18.0	25.5
Properties of fractions:							
Gravity, ° A.P.I.	62.3	45.1	58.9	41.0	36.5	30.4	16.7
Specific gravity at 60° F.	0.7310	0.8012	0.7432	0.8203	0.8423	0.8740	0.9548
Viscosity, seconds Universal:							
At 100° F.	.....	.....	.....	.....	.....	77	.....
At 210° F.	.....	.....	.....	.....	.....	.....	468
Sulfur, weight per cent	.....	.....	0.07	0.06	.....	.....	.....
Aniline point, °F.	135	144	.....	150.5	165.5	184.0	.....
Octane number, A.S.T.M.	54.5	.....	49	.....	.....	.....	.....
A.S.T.M. distillation:							
Initial boiling point	104	.....	108	423	510	.....	.....
10	157	.....	166	435	528	.....	.....
30	204	.....	222	441	535	.....	.....
40	223	.....	243	444	538	.....	.....
50	240	.....	268	447	542	.....	.....
70	275	.....	324	458	549	.....	.....
80	298	.....	347	466	553	.....	.....
90	322	.....	380	476	561	.....	.....
End point	344	.....	416	494	570	.....	.....
Recovery	98.0	.....	98.0	98.1	97.1	.....	.....
Residue	0.9	.....	1.0	1.1	2.8	.....	.....
Loss	1.1	.....	1.0	0.8	0.1	.....	.....

TABLE 12—DISTILLATION ANALYSIS OF MOUNT CARMEL, ILLINOIS, CRUDE OIL

Fraction:	Crude oil	Gaso.	Kero.	Topped crude after Gaso.	Topped crude after Kero.
Yield volume per cent of crude	100.0	36.2	10.0	63.7	53.7
Analysis of fractions:					
Gravity, °A.P.I. at 60° F.	37.5	62.6	41.5	26.1	23.6
Specific gravity at 60° F.	0.8373	0.7290	0.8179	0.8978	0.9123
Sulfur, per cent	0.20	0.02	0.02	0.29	0.32
Mercaptan sulfur, per cent	.....	0.001	0.03	.....	.....
Reid vapor pressure, lb.	.....	10.4	.....	.....	.....
Octane number, motor method	.....	55.0	.....	.....	.....
Cold test, ° F.	—10	.....	.....	15	40
B.s. and w., per cent	Trace	.....	.....	0.1	0.1
Viscosities:					
Kinematic at 100° F., centipoises	.....	.....	1.921	40.54	98.95
Universal at 100° F., seconds	.....	.....	32.4	188.1	457
Flash, Pensky-Martens, °F.	.....	.....	.....	235	295
Salt, as sodium chloride, lb./1,000 bbl.	1	.....	.....	.....	.....
100-cc. distillation:					
Initial boiling point, °F.	105	92	410	449	539
5 per cent	173	120	421	480	566
10	218	142	426	500	585
30	369	207	437	607	654
40	467	232	441	655	682
50	566	255	446	690	697
70	699	300	460	727	742
80	721	327	470	745	756
90	732	361	490	757	760+
End point, °F.	735	400	522	758	760+
Per cent over	95.5	97.5	99.0	95.0	94.0
Per cent bottoms	.....	1.0	1.0	.....	.....
Per cent coke by weight	4.0	.....	.....	5.2	6.1
Per cent loss	.....	1.5	.....	.....	.....
Per cent at 400° F.	34.0	.....	.....	.....	.....
Per cent at 572° F.	51.5	.....	.....	24.5	6.5

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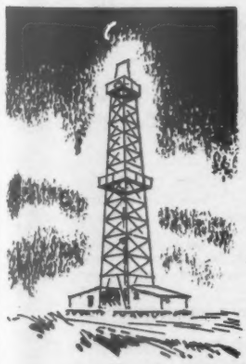


D + B RELIANCE for combating highly-corrosive fluids and excessive load conditions. Manufactured from a carefully selected nickel-copper alloy steel. The entire length of the rod is heated and given a patented precipitation strengthening treatment.

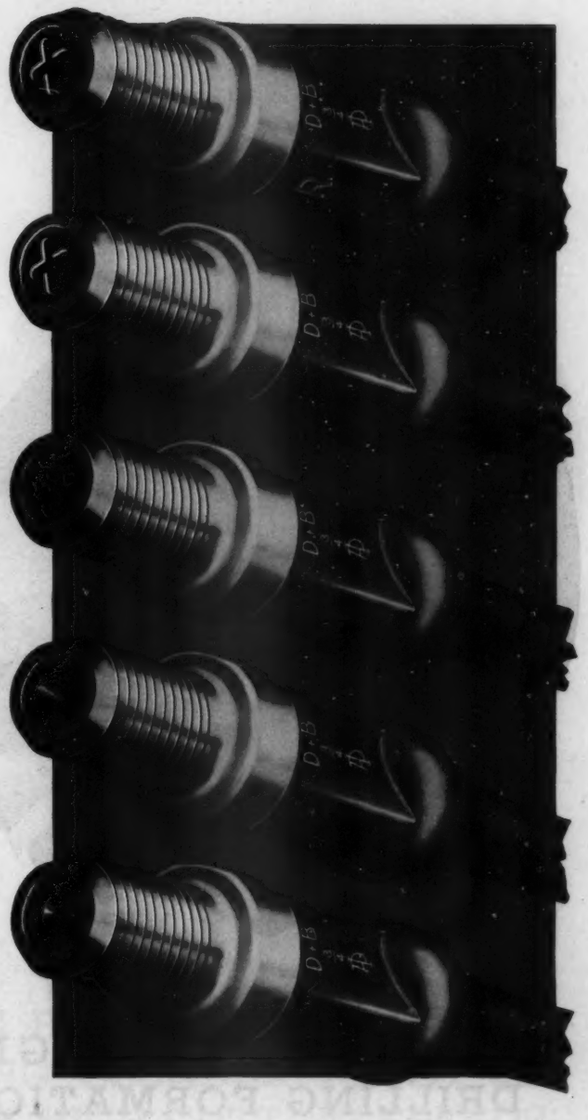
D + B SUPERLOY PLUS is a proven performer where severe corrosion is encountered in combination with heavy pumping loads. Its nickel-copper content gives this rod great strength and resistance to shock and corrosion.

D + B TYPE 5 is especially recommended for corrosive conditions where pumping loads are not excessive. It is made from a nickel molybdenum steel and offers economy for ordinary load conditions.

D + B HEATREAT is made from a medium carbon steel and possesses reasonably high izod and yield point values. It is recommended for medium and heavy loads where corrosion is not severe.

D + B GRADE "A" offers sucker rod economy on wells where corrosion is not encountered on light and medium pumping loads. A high-grade medium carbon steel is used in manufacture.

All D + B Rods are made in strict conformity to A.P.I. specifications



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The REED DK-1T ROCK BIT

FASTER CUTTING SPEEDS

ESPECIALLY DESIGNED FOR DRILLING FORMATIONS COMPOSED OF ALTERNATE HARD AND SOFT LAYERS—VERY SOFT GYP AND ANHYDRITE—SALT

REED ROLLER BIT CO.

TABLE 3—COMBINED RESULTS TOPPING AND CRACKING SALEM CRUDE

Yields, volume per cent of crude (water-free):	
Gasoline	62.7
Side-cut fraction	14.3
Residuum	19.7
Liquid recovery	96.7
Liquid volume loss	3.3
Gas, cu. ft./bbl. of crude	218
Properties of products:	
Untreated gasoline:	
Gravity, °A.P.I.	59.2
Sulfur, per cent	0.08
Vapor pressure, Reid, lb./sq. in.	10.0
Octane No., motor method	64
Octane No., L-3 method	65
100 cc. distillation:	
Initial boiling point, °F.	101
5 per cent	135
10	155
20	190
30	216
40	239
50	261
60	285
70	310
80	337
90	367
End point, °F.	400
Per cent over	97.0
Per cent bottoms	1.0
Per cent loss	2.0
Gasoline composition, liquid volume per cent:	
Propylene	0.32
Propane	0.80
Isobutylene	0.71
n-Butylene	1.74
Butanes	4.03
Pentanes to 115° F.	8.40
Fraction boiling above 115° F.	84.00
Total	100.00
Fraction boiling above 115° F.:	
Gravity, °A.P.I.	54.0
Side-cut fraction:	
Gravity, °A.P.I.	33.7
Sulfur, per cent	0.15
B.s. and w, per cent	0
Viscosity, Universal at 100° F., sec.	33.4
Viscosity, Kinematic at 100° F., cts.	2.21
Flash, Pensky-Martens closed, °F.	160
Pour point, °F.	—25
Cold test, °F.	—30
Aniline point, °F.	119.5
Conradson carbon on 10 per cent residue, per cent	0.17
100 cc. distillation:	
Initial boiling point, °F.	385
5 per cent	423
10	429
20	442
30	453
40	460
50	468
60	480
70	493
80	529
90	549
95	586
End point, °F.	626
Per cent over	99.0
Per cent bottoms	1.0
Residuum:	
Gravity, °A.P.I.	8.8
Viscosity, Furol at 122° F., sec.	277
Flash, Pensky-Martens, °F.	280
Cold test, °F.	45
100 cc. distillation:	
Initial boiling point, °F.	520
Per cent at 572° F.	1.5
Combined receiver and stabilizer gas:	
Density (air = 1.00)	1.104
Composition, per cent by volume:	
Hydrogen	4.5
Nitrogen	1.1
Oxygen	0.0
Carbon monoxide	0.4
Methane	26.1
Ethylene	6.4
Ethane	20.9
Propylene	13.3
Propane	17.0
Butylenes	3.3
Butanes	3.9
Pentanes and heavier hydrocarbons	3.1
Total	100.00
Unsaturates, total	23.0
Propylene and butylenes	16.6
Pentanes and heavier hydrocarbons:	
(As liquid), gal./1,000 cu. ft.	1.1
Per cent by volume of charge	0.6
Hydrogen sulfide (Tutwiler):	
Grains/100 cu. ft.	190
Per cent by volume	0.3

TABLE 5—PROPERTIES OF ILLINOIS PIPE-LINE CRUDE

Gravity, °A.P.I.	38.4
Sulfur, per cent	0.18
Salt as sodium chloride, lb./1,000 bbl.	35
100 cc. distillation:	
Initial boiling point, °F.	110
5 per cent	165
10	206
20	272
30	359
40	452
50	549
60	638
70	690
80	716
90	733
End point, °F.	750
Per cent over	97.5
Per cent coke by weight	2.4
Per cent at 400° F.	33.0
Per cent at 437° F.	38.0
Per cent at 572° F.	54.0

TABLE 7—CRACKING RESULTS ON REDUCED ILLINOIS PIPE-LINE CRUDE

Test No.—	1	2	3
Yields, volume per cent of charge:			
Gasoline	41.2	47.6	52.0
Residuum	54.0	47.9	43.0
Recovery	95.2	95.5	95.0
Liquid volume loss	4.8	4.5	5.0
Gas, cu. ft./bbl. of charge:			
Receiver gas	231	294	324
Stabilizer gas	71	55	42
Total gas	302	349	366
Analyses of products:			
Untreated gasoline:			
Gravity, °A.P.I.	58.8	61.5	60.1
Sulfur, per cent	....	....	0.05
Octane No., motor method	68	69.5	69
Vapor pres., Reid, lb./sq. in.	9.2	12.3	11.6
100 cc. distillation:			
Initial boiling point, °F.	94	93	86
5 per cent	130	120	118
10	148	133	136
20	178	165	170
30	210	196	205
40	236	224	234
50	260	250	258
60	284	272	281
70	306	295	305
80	334	320	334
90	366	358	367
End point, °F.	409	395	404
Per cent over	97.0	94.5	95.5
Per cent bottoms	1.0	1.0	1.0
Per cent loss	2.0	4.5	3.5
Untreated gasoline:			
Composition, liquid volume, per cent:			
Ethane		0.09	
Propylene		0.28	
Propane		0.47	
Isobutylene		1.26	
n-Butylene		4.06	
Butanes		4.19	
Pentanes to 115° F.		11.23	
Fraction boiling over 115° F.		78.42	
Total		100.00	
Fraction boiling over 115° F.:			
Gravity, °A.P.I.		54.1	
Residuum:			
Gravity, °A.P.I.	14.1	11.2	9.0
Viscosity, Saybolt Furol at 122° F., sec.	70	134	244
B.s. and w., per cent	0.6	0.4	0.9
Cold test, °F.	15	20	20
Flash point, Pensky-Martens, °F.	165	190	200
100 cc. distillation:			
Initial boiling point, °F.	452	490	500
Per cent at 572° F.	6.0	5.0	4.0

TABLE 8—PROPERTIES OF GAS FROM CRACKING REDUCED ILLINOIS PIPE-LINE CRUDE

Test No.—	2	
Gas stream—	Receiver	Stabilizer
Density (air = 1.00)	1.06	1.42
Composition, per cent by volume:		
Hydrogen	5.8	0.1
Nitrogen	1.7	0.1
Oxygen	0.0	0.0
Carbon monoxide	0.2	0.0
Methane	30.8	3.5
Ethylene	6.9	2.9
Ethane	20.7	17.7
Propylene	10.4	27.3
Propane	12.1	37.4
Isobutylene	1.4	3.1
n-Butylene	3.4	4.4
Butanes	4.0	3.5
Pentanes and heavier hydrocarbons	2.6	0.0
Total	100.0	100.0
Unsaturates, total	22.1	37.7
Propylene and butylenes	15.2	34.8
Pentanes and heavier hydrocarbons:		
(As liquid), gal./1,000 cu. ft.	0.95	....
Per cent by volume of charge	0.7	....
Hydrogen sulfide, Tutwiler method:		
Grains/100 cu. ft.	10	190
Per cent by volume	Trace	0.3

TABLE 9—TREATMENT OF GASOLINE FROM CRACKING REDUCED ILLINOIS PIPE-LINE CRUDE

Treatment—	None	Doctor Sweetening	U.O.P. Sweetening
Properties of gasolines:			
Gravity, °A.P.I.	59.3	58.8	59.0
Mercaptan sulfur, per cent	0.012	....	....
Total sulfur, per cent	0.05	0.05	0.05
Octane No., motor	68	67.5	67.5
Vapor pres., Reid, lb./sq. in.	10.0	9.0	9.5
Doctor test	Pos.	Neg.	Neg.
Peroxide No.	0.18	....	....
Color, °Saybolt	—2	....	....
Gum, copper dish, mg./100 cc.:			
Without inhibitor	370	295	366
With U.O.P. inhibitor No. 1, 0.05 per cent	....	5	14
With U.O.P. inhibitor No. 4, 0.01 per cent	....	6	5
Oxygen bomb induction period, min.:			
Without inhibitor	140	110	155
With U.O.P. inhibitor, No. 1, 0.05 per cent	...	280	300
With U.O.P. inhibitor, No. 4, 0.01 per cent	...	250	320
100 cc. distillation:			
Initial boiling point, °F.	98	102	96
10 per cent	149	157	142
50	253	254	258
90	359	358	355
End point, °F.	400	399	400

FOR THE BROKEN FORMATIONS

The REED DK-1AA ROCK BIT

FULL GAUGE HOLE

HAS BEEN ESPECIALLY DESIGNED WITH LONG, SLENDER TEETH TO GIVE VERY HIGH CUTTING SPEEDS IN THE SOFTER FORMATIONS, SUCH AS: LONG SHALE BREAKS THAT CONTAIN VERY LITTLE LIME.

REED ROLLER BIT CO.

ducing horizons, Cypress and Bethel, shows 38.0° A.P.I. gravity with yields on fractionation of 36.7 per cent of 49 octane 416° F. end-point gasoline, 8.0 per cent kerosene, 10.0 per cent of 36.5° A.P.I. gravity gas oil, and 18.0 per cent of 30.4°. A.P.I. gravity wax distillate and a 16.7° A.P.I. gravity residue representing 25.5 per cent of the crude. These data are included in the detailed Tables 10 and 11.

From these results it may be seen that the Louden crude is slightly lighter than the Salem crude but contains similar amounts of gasoline of equal quality. The Louden crude is quite typical of the Illinois crudes and in processing will give products with yields and properties similar to those shown for the Salem and Illinois pipeline crudes. Like the other Illinois crudes this oil may be separated into a light straightrun fraction, having an octane rating sufficiently high to reach market standards. The naphtha remaining may be reformed to bring its octane rating to the 70-73 standard of today.

In Table 12 is shown the properties of Mount Carmel crude produced in Wabash County from the McClosky formation at a depth of 2,556 ft. While this production is not important in volume it is typical of the smaller production areas brought in during the past year. A second small pool is the Sandoval in Clinton County, analysis of the crude being given in Table 13. Comparison of these two crudes shows the 37.5° A.P.I. gravity Mount Carmel oil to contain 36.2 per cent of 55-octane gasoline while the 38.1° A.P.I. gravity Sandoval crude contains only 32.8 per cent of 50-octane gasoline. Further, the Mount Carmel crude with its higher yield of straightrun gasoline produces a 26.1° A.P.I. gravity topped crude as compared with a 28.7° A.P.I. gravity topped crude after removal of gasoline of the same boiling range from the Sandoval crude. This serves to illustrate a significant characteristic of the Illinois crudes, i.e., crude gravity alone is not a reliable index of straightrun gasoline yield or quality. If, however, cracking of the topped or reduced crudes is taken into consideration, the overall yield of cracked and straightrun gasoline will be better related to crude gravity since variations in yield of straightrun gasoline are reflected in compensating variations in cracking-stock quality.

TABLE 10—PROPERTIES OF LOUDEN POOL, FAYETTE COUNTY, CRUDE OIL

Gravity, °A.P.I.	38.0
Specific gravity at 60° F.	0.8348
Cold test, °F.	Below —35
B.s. and w., per cent	0.1
Viscosity, Universal at 100° F., sec.	41
Sulfur, wt., per cent	0.25
Water, per cent	0.0
2,000 cc. column distillation:	
Initial boiling point, °F.	79
10 per cent	197
20	279
30	360
40	466
50	559
60	665
72	824

TABLE 13—DISTILLATION ANALYSIS OF SANDOVAL, ILLINOIS, CRUDE OIL

		Overhead			Topped crudes after		
Fraction:	Crude	Gaso.	Kero.	Gas oil	Gaso.	Kero.	Gas oil
Yields:							
Volume per cent of crude	100.0	32.8	11.0	26.9	67.1	56.1	29.2
Analysis of fractions:							
Gravity, °A.P.I. at 60° F.	38.1	62.6	41.5	32.6	28.7	26.5	21.4
Specific gravity at 60° F.	0.8343	0.7290	0.8179	0.8623	0.8833	0.8956	0.9254
Sulfur, per cent	0.35	0.07	0.19	0.27	0.45	.....	0.70
Mercaptan sulfur, per cent	.....	0.046	0.132	.....	.....	.....	.....
Octane number, motor method	.....	50.0	.....	.....	.....	.....	.....
Reid vapor pressure, lb.	.....	8.0	.....	.....	.....	.....	.....
Viscosities:							
Kinematic at 100° F., centipoises	.....	.....	1.89	8.60	33.22	.....	.....
Kinematic at 210° F., centipoises	.....	.....	.....	.....	.....	8.58	43.0
Universal at 100° F., seconds	.....	.....	32.1	54.1	155.2	.....	.....
Universal at 210° F., seconds	.....	.....	.....	.....	.....	54.0	199
Ash	.....	.....	.....	None	.....	.....	.....
Conradson carbon, per cent	.....	.....	.....	<0.01	.....	.....	.....
Aniline point:							
°C.	.....	.....	.....	80.8	.....	.....	.....
°F.	.....	.....	.....	177.4	.....	.....	.....
B.s. and w., per cent	0.2	.....	.....	0.0	0.2	0.3	0.4
Cold test, °F.	5	.....	.....	45	15	.....	60
Flash, Pensky-Martens, °F.	.....	.....	.....	275	235	290	500+
Salt, as sodium chloride, lb./1,000 bbl.	2	.....	.....	.....	.....	.....	.....
100-ml. distillation:							
Initial boiling point, °F.	125	101	415	537	446	545	480
5 per cent	190	137	426	552	479	569	656
10	234	156	429	560	506	587	679
20	312	189	433	576	550	623	697
30	396	215	438	592	612	662	709
40	489	238	443	611	665	690	719
50	586	260	448	630	693	706	729
60	662	281	454	651	712	717	736
70	697	303	463	673	726	732	744
80	727	327	474	697	736	749	752
90	746	360	490	725	749	760+	757
95	752	380	508	748	760+	.....	.....
End point, °F.	752	399	525	760+	760+	760+	757
Per cent over	98.0	98.0	99.0	99.0	98.0	97.5	95.0
Per cent bottoms	.....	1.0	1.0	1.0	.....	.....	.....
Per cent coke by weight	1.6	.....	.....	.....	2.3	2.6	5.0
Per cent loss	.....	1.0	.....	.....	.....	.....	.....
Per cent at 400° F.	31.0	.....	.....	.....	.....	.....	.....
Per cent at 572° F.	48.5	.....	.....	17.0	23.5	6.0	.....

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OPERATING IDEAS

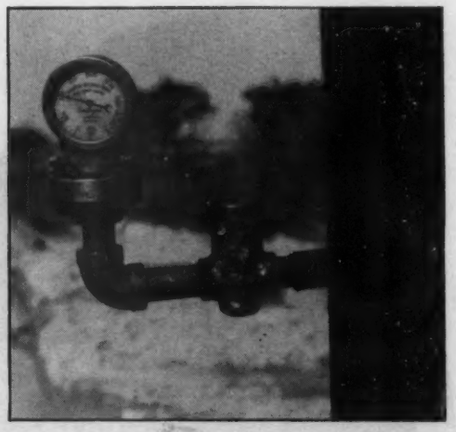
Short, illustrated kinks photographed in Illinois fields by the Journal's representative

Movable Counterbalances for Rod Lines

In the Central basin area, of Illinois, the geared powers are constructed as the wells are being drilled and oftentimes the wells on one side of a power will be on the pump while the wells on the other side are either still flowing or are uncompleted. To balance the power becomes a problem solved by the installations above. In the foreground is a pair of counterbalances often seen in pumping areas but they are different in that they are mounted on skids instead of being built as a permanent installation. Whenever the wells beyond the counterbalances go on the beam, these "dead-men" can be taken to another power. In the background can be seen one of the swings used to reverse the direction of pull, in this case the angle between the rod from the power and the rod to the jack being only about 30°; this means that the jack being operated is on the opposite side of the power from the swing.

Mud-Pressure Gage Located on Air Chamber

For quick rigging up of the pump gage, this contractor has had a 2-in. collar welded into the air chamber; no union is required and only one connection needs to be made to put it in place. The operation of the gage is much



smoother in such a location as the dampening effect of the air chamber helps reduce the pulsations on the gage. In case the gage needs any repairs, the stop between it and the air chamber is closed and gage removed.

Trestles for Welding

To facilitate the construction work and at the same time provide an adjustable support for tubular material and rods which will come in handy, an Illinois welder built the illustrated trestles while installing a geared power. They are made from junk sucker rods with plates of sheet metal on each leg to prevent its sinking in the mud.

Junk Box on Skids Speeds Up Moving

This Illinois rig averages two moves monthly and would lose much of its incidental equipment and "junk" if it were not for the open box, seen above, which is mounted on skids. It can thus be loaded on a truck or pulled through the mud. It contains old chain, surface hole bits, drive bushing for the extra kelly, casing slips, old valves, subs and other important items which are really not junk but are ordinarily carried in closed tool boxes or houses and have to be loaded and unloaded each time the rig is moved.

A GENERAL PURPOSE BIT

The REED DK-1 ROCK BIT

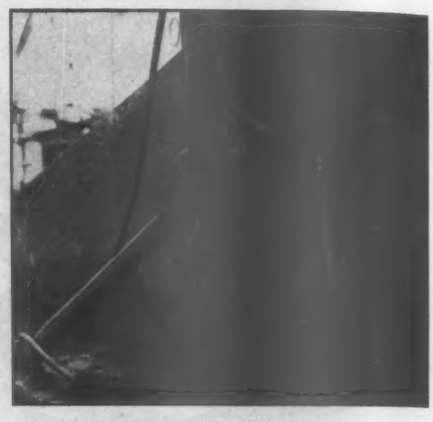
SPEED WITH LESS WEIGHT

A GENERAL PURPOSE BIT
ESPECIALLY DESIGNED TO GIVE
HIGH CUTTING SPEEDS
AND
MAXIMUM HOLE

REED ROLLER BIT CO.

OPERATING IDEAS

Guides Prevent Fouling of Jerk Line



Many of the hoists used in the basin fields are quite old and have many pieces of equipment projecting out where lines can be fouled. This is particularly aggravating to the pipe racker who finds he can not get his tongs in proper position because the jerk line is fouled on the end of a shaft or on a control rod. This unitized rig had a low line shaft and consequently the jerk line practically lies on the floor. A sucker rod from the floor to the roller prevents its fouling, while a 1½-in. pipe from the floor to the bearing cap on the line shaft, prevents its fouling on the cathead control or the drum shaft.

•

Old Elevators Support Rathole

Ratholes cannot always be drilled to the same depth and this means the rathole pipe

would have to be remodeled twice a month in Illinois. This company cases its ratholes to within a couple of feet of bottom but depends on a pair of old 10½-in. casing elevators to support the pipe instead of having it sit on bottom. The upper pair of elevators reveal the resourcefulness of drillers. The regular kelly on the rig had to be sent to the shop for repairs and the replacement was too short. The 7-in. casing elevators were larger than the kelly but smaller than the sub on its top. They keep the kelly from going into the rathole until the swivel would catch it. With the swivel in such a position it would be practically impossible to unlatch or latch the hook on the swivel bail. The extra set of elevators holds the swivel up and the latching and unlatching with this arrangement is as easy as it was with the regular kelly.

•

Counterbalance Guides Are Outside Derrick

Mast rigs ordinarily do not contain enough room on the floor to hold all of the equipment necessary on a rotary-drilling operation. In the accompanying picture, the air chamber is located outside instead of inside but the unusual feature is the guides for the tong counterbalances which are fastened along

the outside leg of the derrick. A type of tong common to large rigs is used on this job and the counterbalances must be quite large. Each counterbalance has two sleeves which will slide over a 2-in. pipe. The 2-in. pipe is held parallel to and about 18 in. from the derrick leg by a piece welded at the top normal to its main axis. The counterbalances are free to slide up and down this pipe and the collars, top and bottom, prevent binding.

FOR THE HARDER LIMES

The REED DK-1L ROCK BIT

STRAIGHT HOLE

DESIGNED FOR THE HARDER LIMES THAT ARE NOT EXTREMELY ABRASIVE AND BROKEN FORMATIONS CONTAINING AN EQUAL AMOUNT OF SHALE AND LIME.

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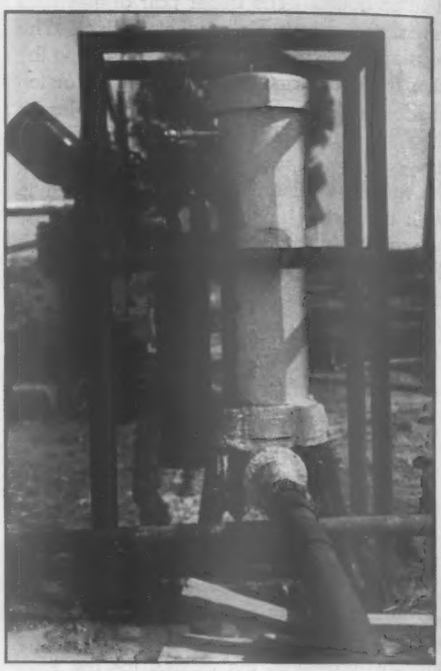
OPERATING IDEAS

Case for Lubricator



Moving a steam lubricator frequently results in damage to many of the small connections on it as they may be broken by a comparatively light blow. This lubricator on an Illinois rig is quite safe as it is enclosed in a case made from old 2-in. pipe welded around it. It is only necessary to disconnect two unions and lift the case and lubricator with a winch line around the upper cross pieces.

Starting Switches Near Driller

On many mechanical rigs, switches for electric cranking of the engines are located on the engines' panel board; when an engine dies from over-loading or any other cause, it is necessary for a member of the crew to go to the engine, disengage the clutch, and press the starter button. This rig has remote controls for the starter switches located on the A-brace just back of the throttles and a lever which will disengage the engine clutches. In case the driller kills the engines, he has only to throw out the clutch and touch the starter buttons while at the same time controlling the throttles.

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BRIEF SPECIFICATIONS

UNIT NO.	401	608	708	907	1208
Reducer Type	Chain	Chain	Chain	Gear	Gear
Beam Rating	4000 lb.	7416 lb.	7416 lb.	10100 lb.	13000 lb.
HP Rating	6.00	9.65	6.00	11.40	19.78
Peak Torque	30000	47768	30000	56500	131733
Maximum Stroke	24"	33"	32"	36"	54"

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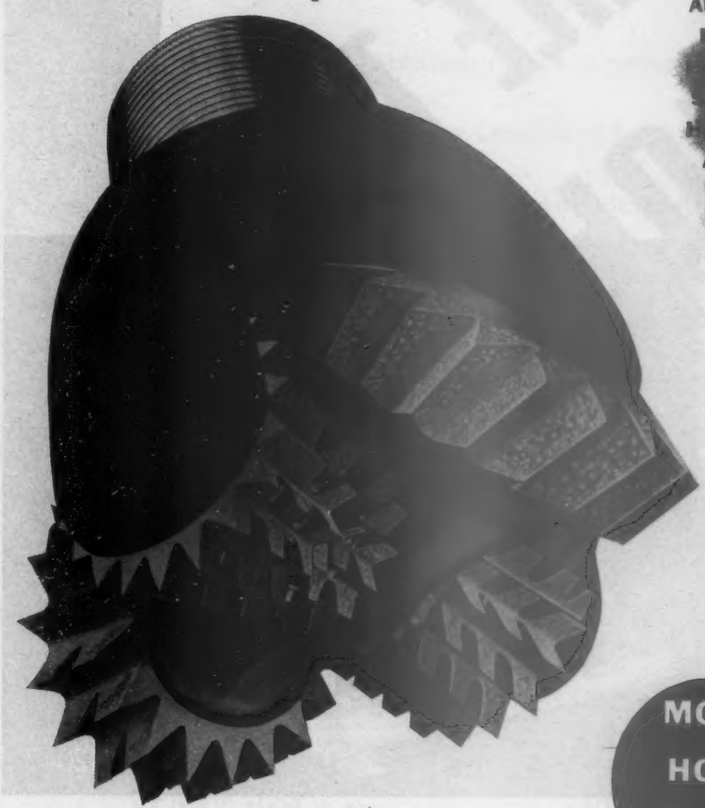
FOR HARDER, MORE ABRASIVE FORMATIONS

The REED
DK-2
ROCK BIT



MORE
HOLE
PER BIT

THE DK-2 TYPE IS FURNISHED IN THE DK-2 AND DK-2C. THE DK-2 IS RECOMMENDED FOR THE HARDER FORMATIONS NOT EASILY CHIPPED OR BROKEN AND THE DK-2C IS ESPECIALLY RECOMMENDED FOR THE HARDER, MORE ABRASIVE FORMATIONS.

REED ROLLER BIT CO.

OPERATING IDEAS

Pull-Back Post for Rathole

There is a variety of methods for disposing of the kelly joint while making a trip or connection on a mast rig but this operator chose to put it in a rathole the same as on a regular derrick. Swinging the kelly off of the derrick floor takes a bit of work so this crew arranged the pull-back post outside of the derrick and beyond the rathole. A 4-in. pipe was buried several feet in the ground and the hole around it filled with concrete; it was then braced with an ordinary piece of guy wire at the end of the 8 by 10-in. timber which is part of the pipe rack. An ordinary hay pulley was used for the reversal of the direction of pull. The rope is used on the off cathead instead of the cathead nearest the driller. The shadow of the derrick can be seen beyond the post while the rathole casing can be seen in the center foreground.

Combination Snubbing and Spring Anchor Post

Newer-type derricks have wider V-doors which are an advantage but which also require that some means be provided for anchoring the snub rope and casing spring. The arrangement shown here was designed by one of the oldest rotary drillers in Illi-

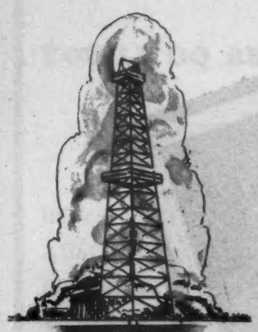
nois in point of service. It is located on a major company's rig at work in the Central basin area. It is built so that it is similar to a backup post with a 4-in. upright and two 2-in. braces running to the steel bottom plate. A piece of sand line running to a turnbuckle on the back of the post anchors it in place. Rope for snubbing the drill pipe as it swings in the V-door is attached to one loop, the casing spring (used by some crews to hold the tongs in position while making a trip) is attached by a 1020 chain link to another eye while the catline is held by a third eye located near the bottom of the main post.

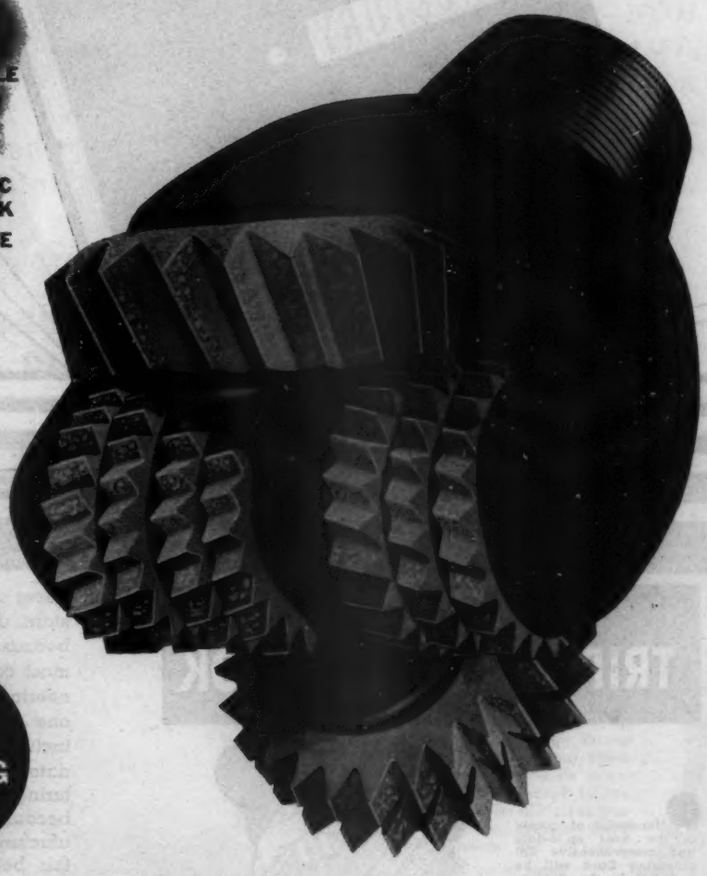
Air Filter Inside Building

Even the swamps of Illinois become quite dusty during the summer months when the rivers stay in their normal channels. Travel on the oil-field roads keep much of the dust in the air. This engine, used for the operation of a geared power, has its air intake protected by a filter. The filter is located inside the building to relieve it of some of its load.

FOR EXTREMELY HARD FORMATIONS

The REED DK-3 ROCK BIT





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THERE ARE THREE TYPES OF THE REED DK-3 ROCK BIT. THEY HAVE BEEN SPECIFICALLY DESIGNED FOR THE HARD FORMATIONS. THE DK-3 IS RECOMMENDED FOR THE ORDINARY HARD FORMATION. THE DK-3C FOR THE VERY HARD AND ABRASIVE FORMATION AND THE DK-3D FOR THE EXTREMELY HARD FORMATIONS, SUBJECT TO BEING CRUSHED.

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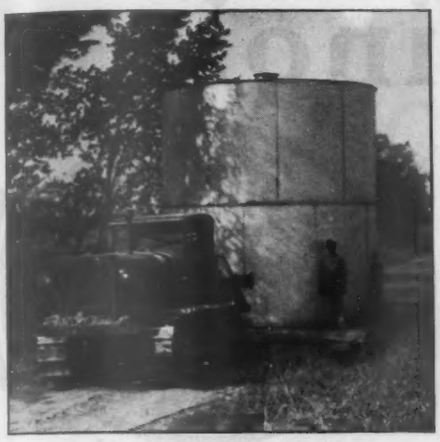
OPERATING IDEAS

Moving 500-Bbl. Tank Without Dismantling



Flush production often requires several 500-bbl. tanks to handle a single well during its early stages but after a time some of the tankage may be removed to newer and more prolific leases. Generally this calls for dismantling the tank, loading it on a truck and hauling it to the new location where it is re-erected. A company having extensive operations in one area has borrowed a method from the house movers; the tank is jacked up; a platform is built, on 8 by 10-in. skids, which is placed under the tank. The tank can then be pulled down by-roads and across the fields without damage and unlocated at its new location. Each bolt in the tank is tightened before the tank is placed in service to prevent its leaking.

•

Junk Bin From Old Tubing

On many of the old leases in eastern Illinois very little machinery or equipment is thrown away even when it is of no use. The larger pieces are placed on racks but the small pieces are generally thrown on a pile. One major company operating in this area makes large bins from old tubing to hold this junk material. This useless material is often culled to find some replacement part that would otherwise have to be made in the machine shop. Whenever the bin becomes full, it is emptied by selling its contents to the junk man.

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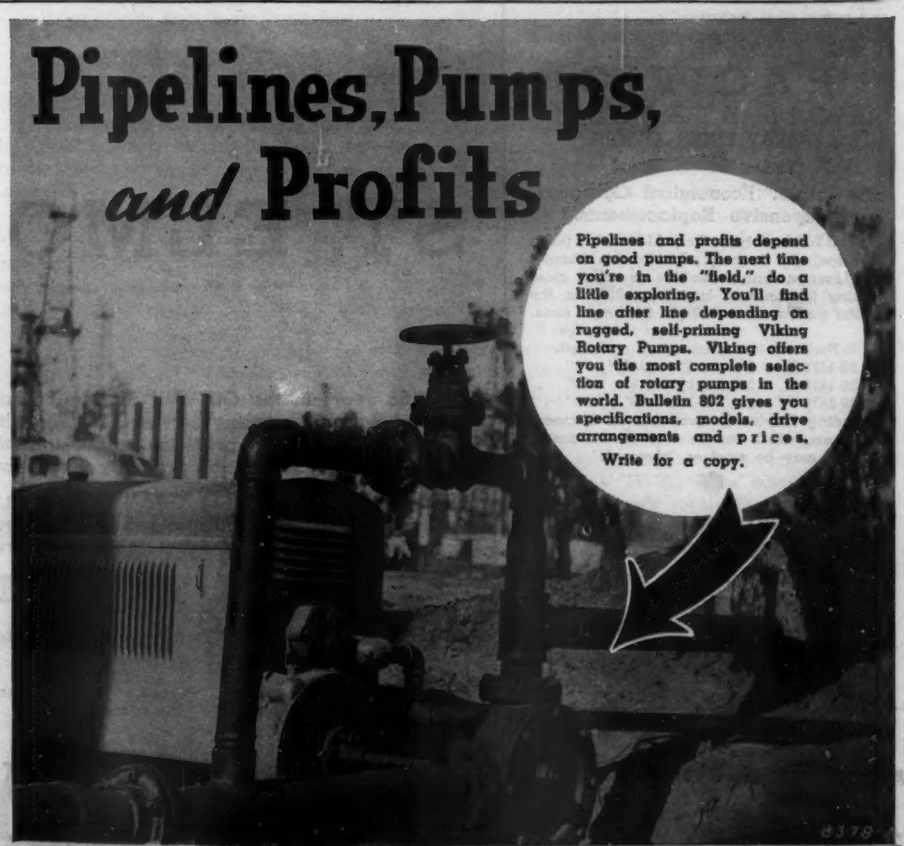
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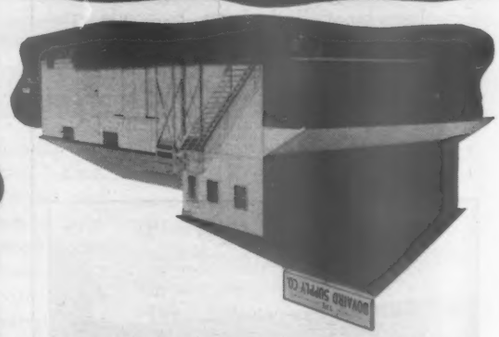

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Illinois Develops Own Producing Practices

By HARRY F. SIMONS

Tank, separators, manifold, and vertical treating unit on a large lease in the Salem field

AT the opening of the Illinois basin over 2½ years ago little was known of the producing characteristics of the different horizons and most of the production men who had been drawn into the basin activity were unfamiliar with the problems. Many of them had gained their experience in territories where pressures were high, and the tendency was to play safe and take no chance of letting a well get beyond control. The procedure followed in completing a well and the selection of the equipment was dictated by the background of the operator; and as oil men from all over the country came into the basin, a wide range of ideas was introduced.

The present oil revival has been going on long enough now to allow for a study of the conditions and economics involved, and the operators in the area have gradually come to certain practices, although the basin fields, because of their wide variation, do not allow for any general standard procedure.

An area having the multiplicity of producing horizons, variation in pressures from almost zero up to 1,250 lb. per sq. in., gas-oil ratios varying from 250 cu. ft. per bbl. to 3,500 cu. ft. per bbl., and a wide range of water conditions can scarcely permit any standardization in practice or equipment. In the several fields in the state equipment has become standardized to some extent, with the exception of tankage, and this is greatly dependent on the operators' whims or their market for the produced crude.

One of the principal features in the basin developments has been the reduction in the size of the hole and the casing, tubing, and rods used. In some cases, operators have been able to pump their wells with smaller units and engines than formerly by the use of smaller tubing.

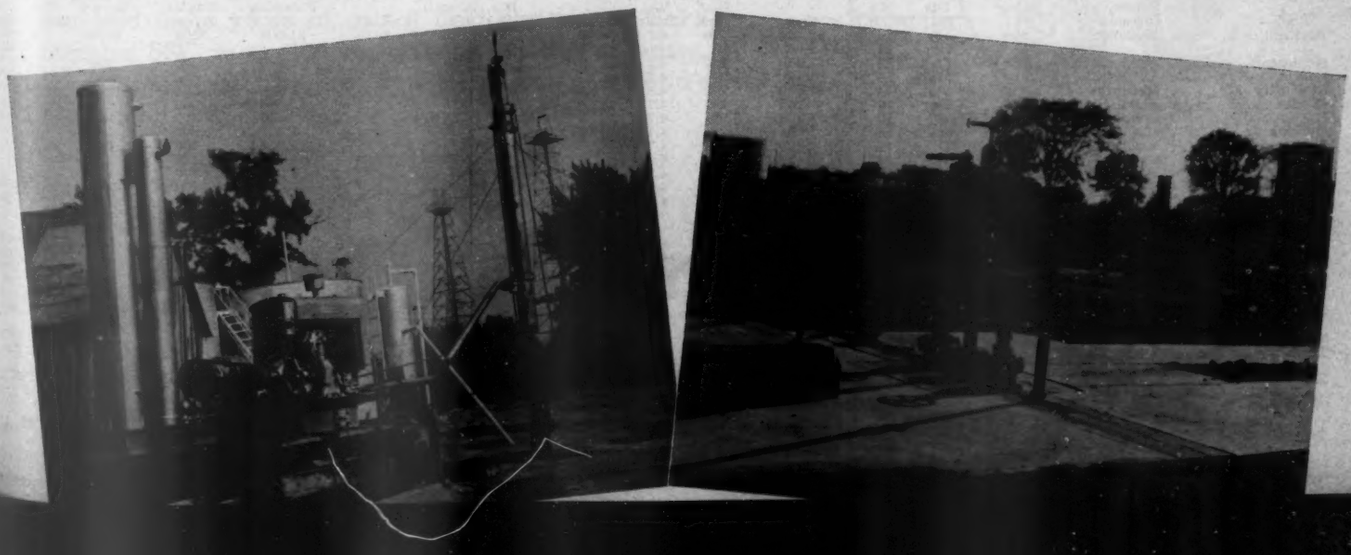
Most common practice a year ago was to drill from 100 to 200 ft. of 12¼-in. surface hole and case it with 10¾-in. lap weld or seamless casing. This was followed by drilling of an 8¼, 8¾, or 9-in. hole to the top of the pay and then running 7-in. o.d. pipe, sometimes 17-lb. per ft. casing being used and other operators favoring heavier pipe. Two-and-a-half-inch upset tubing was generally used, and ¾-in. or ⅞-in. rods were required. The consequence was that a heavy pumping unit was needed to lift the heavier rods and fluid column inside the larger tubing.

Operators soon found the prediction that the Illinois basin fields would be produced by pumping was all too true, and the wells declined rapidly to the point where 2½-in. tubing was not only unnecessary but in many cases was a hindrance to successful pumping performance. Added to this was the constantly tightening market and the limitation on the amount of production many operators were able to sell.

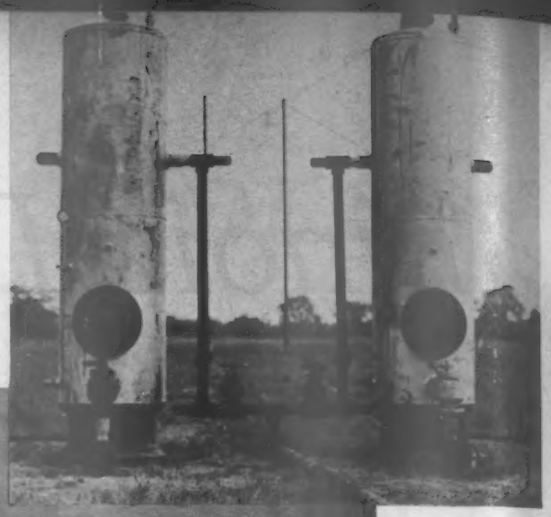
No survey of the number of wells being pumped or the average flowing life of the wells has been attempted, but a safe estimate would be about 90 per cent, or 3,680 of the 4,200 wells, are on the pump at the present time.

The best wells do not flow long for a variety of reasons, principal among them being the character of the producing formations. Most of the Chester sands are quite shaly, the replacement of the sand by shale accounting for dry holes within

Left: Hydraulic pumper being used in the Keensburg field. Right: Well head equipped for gas lifting on a lease in the Salem field



producing areas. The shale streaks are not continuous or uniform in thickness, varying from a fraction of an inch to several feet. The vertical movement of fluid or gas through such a formation is therefore restricted, and there is little utilization of gas in formation in the production of the oil. In the McClosky-lime pools more gas is encountered, but in the better pools the porosity and permeability of the zone are so well developed that the gas rushes into the well bore and does little driving. It is for this latter reason that Pure Oil Co., Kingwood Oil Co., and other operators in the lime fields have developed a completion method that will reduce the gas-oil ratio on their wells and preserve this gas in the formation in a position to drive the oil into the well bore.



Right: Twin separators used to handle production on recent large completion. Below: Separators and tanks near Wabash River must be on platforms

Short Flowing Life

The short flowing life of the wells adds to the lifting costs, and the operators immediately started to reduce the cost of well equipment. Through the use of 2⅜-in. o.d. 4.7-lb. per ft. instead of 2⅞-in. o.d. 6.5-lb. per ft. tubing, a saving of $8.50 per 100 ft. was effected. The saving on casing by reducing from 7 in. to 5½ in. o.d. was $11.75, or $15.09 per 100 ft., depending on whether 5½-in. o.d. 15-lb. per ft. or the same size weighing 14 lb. per ft. was used. Reduction in the rod size saved $2.50 per 100 ft., making a total saving of $32.25 or $35.50 per 100 ft., depending on the weight of the 5½-in, pipe used. This meant a reduction of over $1,000 in the cost per well.

The accompanying table is based on the most common practice in the most active fields in the basin at the present time. The prices listed for casing, tubing, and rods are for goods delivered in car lots to Centralia, Ill. This is the most common way of purchasing material in the basin, although many small operators prefer to purchase out of stock. For such type purchases 10 per cent should be added to the cost. Other well equipment varies widely in price, but the figures quoted are the approximate price of these items. No effort has been made to check the cost of each well installation and arrive at an average figure per well, as this would involve detailed information from each lease. The total figure given is for the equipping of a well by the most widely used method in each area. Wells may be equipped for more or less money, depending on the desires of the operator.

While most of the pumping is now done by individual units, extensive use of centrally located geared powers is noticeable in some areas, particularly in the Central-basin fields and by several companies in the Salem pool. They are used mostly by companies having large leases. However, two of the largest operators in the area are using electrically driven individual units for pumping, one of them manufacturing the current in conjunction with its repressuring system and the other purchasing the power from a local utility concern. The average geared power in use costs from $10,000 to $12,000, but it will handle as high as 26 wells, and in some cases one power has been used to pump as many as 30 wells. The cost of a 3 to 5-hp. electric motor for driving a pumping unit is approximately $55 to $70, respectively, but there is the additional cost of installing transmission lines, transformers and meters.

Proper location of tubing perforations is important in the reduction of valve pounding and the horsepower required to lift the oil. Casing

Strip leases in Salem field provide a display of pumping equipment and tankage

Pool—	Producing formation	Depth (ft.)	Casing Size Dia. (in.)	Casing Size Wt. (lb./ft.)	Casing Cost	Tubing Size Dia. (in.)	Tubing Size Wt. (lb./ft.)	Tubing Cost	Rods Size Dia. (in.)	Rods Size Length (ft.)	Rods Cost	Pumping unit	Engine, av. cost	Tubing head, regulator, working barrel, etc.	Total cost (less tankage)
Barnhill	McClosky	3,386	5½	14	$2,100	2⅜	4.7	$915	¾	25	$425	$1.000	$500	$100	$5,040
			7	17	2,600										5,540
Boyleston	McClosky	3,253	7	17	2,550	2⅜	4.7	870	¾	25	405	1,000	500	100	5,425
Calvin	McClosky	3,016	5½	14	1,860	2⅜	4.7	810	¾	25	375	1,000	500	100	4,645
Clay City	McClosky	2,984	5½	14	1,850	2⅜	4.8	800	¾	25	370	1,000	500	100	4,620
Cordes	Benoist	1,228	5½	14	765	2⅜	4.7	332	⅞	25	122	450	300	100	2,069
Dix	Benoist	1,950	5½	15	1,275	2⅜	4.7	525	⅞	25	195	450	300	100	2,845
Dundas	McClosky	2,830	5½	14	1,755	2⅜	4.7	755	¾	25	350	1,000	500	100	4,460
Enterprise	McClosky	3,000	7	17	2,320	2⅜	4.7	810	¾	25	375	1,000	500	100	5,105
Griffin	Cypress	2,400	5½	14	1,420	2⅜	4.7	650	⅞	25	240	450	400	100	3,260
	McClosky	2,863	5½	14	1,710	2⅜	4.7	770	¾	25	345	1,000	500	100	4,425
Keensburg	Cypress	2,400	5½	14	1,420	2⅜	4.7	650	⅞	25	240	450	400	100	3,260
Louden	Bethel	1,500	5½	15	980	2⅜	4.7	405	⅞	25	150	450	300	100	2,385
	Paint Creek														
	Cypress														
Marcoe	McClosky	2,746	7	17	2,110	2⅜	4.7	740	¾	25	345	675	370	100	4,340
Mill Shoals	Aux Vases	3,250	5½	15	2,130	2⅜	4.7	880	¾	25	406	1,000	500	100	5,016
	McClosky	3,360	5½	15	2,195	2⅜	4.7	920							5,121
North Noble	Cypress	2,550	5½	14	1,585	2⅜	4.7	690	¾	25	320	1,000	500	100	4,195
	McClosky	2,950	5½	14	1,835	2⅜	4.7	795	¾	25	370	1,000	500	100	4,600
Salem	Bethel	1,850	7	17	1,430	2⅜	4.7	500	⅞	25	185	675	500	100	3,390
	McClosky														
Sandoval	Devonian	2,900	7	17	2,240	2⅜	4.7	785	¾	25	535	1,000	500	100	5,160
Tonti	McClosky	2,150	7	17	1,660	2⅜	4.7	580	⅞	25	215	675	500	100	3,730

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In addition to the beam method of pumping, several other lifting methods have been attempted: electrically driven centrifugal bottom-hole pumps, hydraulically operated pumps, and gas lift. The former is still in the experimental stage and is handicapped to some extent by the low fluid level common to the wells a short time after completion. The single gas lift is on a Kingwood Oil Co. lease in the Salem field and at the present time is reported as functioning satisfactorily. This field has the largest gas production of any gas or oil pool in the area; and if properly handled, much of the production could be lifted in this manner. The Kingwood plant was installed after the well had been placed on the pump. Hydraulic pumping is being tried on several wells, but it is still experimental and hasn't yet shown any superiority to the beam methods.

The attempts to repressure in one instance and pressure maintenance in the other have shown favorable results, although Carter Oil Co.'s operation in the Louden field has been more successful because much of the repressured zone has had its withdrawals restricted. The Texas Co.'s operation in the Salem field has been hampered by the unrestricted withdrawal in many cases by offset operators. Acquisition of some of the stripper leases and the securing of agreement of offset operators to restrict withdrawals will make the Salem project much more effective and will eventually be a major factor in determining total recovery from the pool.

One of the most troublesome problems has been the presence of sulfate waters in or near the producing horizon. This has resulted in the failure of rod strings, casing, and cement and for a time caused many repair jobs. Sulfate-resistant cement is being used in areas where corrosive waters are known to be present, and it has been successful in eliminating much of the trouble. Plugging off bottom-hole water as soon as it appears has also helped. In particularly bad areas the wells have been equipped with rods made from corrosion-resistant metals.

The water table in most fields is poorly defined, and in some fields there is little evidence of a hydrostatic drive. However, drilling too deep has generally resulted in an undesirably large amount of water as has too heavy shooting and excessively large acid treatments. Wells completed with the idea of gaining as high initial production as possible (drilling of full pay section and heavy shots and acidization near bottom) go to producing water much quicker than do those completed in a more conservative manner. The early water encroachment will increase lifting and treating costs and will eventually lead to the premature abandonment of some of these wells. Treating systems are a common sight in the basin fields on leases that obtained their original production in 1939.

The disposal of salt water in the basin will be a problem if the volume becomes great. At the present time several salt-water-disposal wells are in use and are taking the water produced, although it still does not amount to much. In the new Sandoval field sulfur water is in contact with the oil, and most of the wells make some water, which is being evaporated by a gas flame over an open pit.

Gas-oil separation is effected by the use of small separators centrally located with several wells being flowed into each separator. Tankage varies widely, although most operators favor the 210-bbl. welded tanks, because they can be moved from the lease as a unit when the flush is gone from the wells. In some cases, bolted tanks have been moved without disassembling.

A high-water problem not present in other basin areas is presented in the fields along the Wabash River. Operators in the region are placing pumping jacks, separators, tankage, etc., on steel substructures or high earthen mounds. Drilling wells in the river bottoms will need to be placed on high substructures during the winter months.

Illinois Production Forces Increased Pipe-Line Outlets

By PAUL REED

Coating and wrapping on Socony-Vacuum Oil Co.'s line built during the summer

THE need for transportation facilities to handle the rapidly increasing oil production of the Illinois basin fields has stimulated, during 1939, the greatest pipe-line building program the industry has seen in recent years. The program is notable because of the investment of $14,000,000 through the laying of more than 800 miles of large, new lines and the looping of old ones.

This region has the distinction of possessing a pipe-line problem which is peculiar to itself. This situation arose from the fact that one major trunk line in the vicinity of the new fields has been handling large quantities of the production as a common carrier for several companies. However, before discussing the most important ramifications of the resulting interconnecting lines, which this arrangement occasioned, certain general observations should be made to indicate the broad significance of the recent pipe-line developments.

Early 1939 Developments

During early 1939, when oil production in the Illinois basin jumped from 126,000 bbl. per day to 350,000 bbl., the capacity of the state's pipe-line outlets was increased from 125,000 bbl. to 270,000 bbl. The quantities of oil transported through pipe lines to refineries outside the basin area has increased from 85,000 bbl. to 210,000 bbl. so far this year. At the same time the quantities of oil gathered by refineries, located near the field and transported through their own pipe-line systems has increased from 10,000 bbl. to 26,700 bbl. In addition there are 55,000 bbl. of independent refining capacity outside the basin which is reached by pipe lines leading out of the basin.

In the spring of this year the movement of oil was restricted because of lack of adequate outlets. At present there is an excess of crude-oil pipe-line capacity amounting to 60,000 bbl. At this time about 42,000 bbl. of crude oil is moving from the Illinois fields by tank car. It has been estimated that 12,000 bbl. are transported along the Ohio River by barges from Mount Vernon, Ind., and Birk City, Ky. Between 600 and 700 bbl. per day are moved by trucks.

Lining up a joint in stove-pipe method used by Williams Brothers on Sohio 8-in. line, Salem to Stoy

The unusual features of the pipe-line situation in Illinois are the results of the particular set of circumstances which existed before and immediately after new oil production was found. When development of new fields assumed great importance 3 years ago, several transcontinental trunk systems served the basin region. Of these, the Illinois Pipe Line Co.'s system played the most important part. Because of its location, connections, and capacity it has been able to move great quantities of oil east and west. For this reason, throughout the early boom period, the Illinois pipe line held a dominant position.

In addition to serving as an important link in the great trunk-line system which delivers oil from Mid-Continent fields to middle western and Atlantic seaboard refineries, the Illinois pipe line purchases a limited quantity of oil in the Illinois fields at Prairie Creek, Ind., and in old stripper fields of the area for delivery to the trunk line through its gathering system. However, at this time of production activity the largest volume is handled by the Illinois system as a common carrier, transporting oil eastward to the Buckeye Pipe Line at Lima, Ohio, and westward to refineries at Wood River, Ill. A phase peculiar to these common-carrier shipments is the fact that oil is brought to the Illinois trunk line through lines built by the Oklahoma Pipe Line Co., Pure Oil Co., and Standard Oil Co. (Ohio).

Before the "rediscovery" of Illinois, the Illinois trunk-line system consisted of 360 miles of three 8-in. lines from East St. Louis to Lima, Ohio, with a capacity of 85,000 bbl. Later in 1939 this was enlarged by laying the following loops: 127 miles of 10-in., 31 miles of 12-in., and 40 miles of 8-in. line. These increased the capacity of the system from 85,000 to 110,000 bbl. per day.

This trunk line was originally built more than 30 years ago. Pumping equipment at the main-line stations is all steam driven. The prevailing practice has been to burn low-priced coal mined in the state. This year some of the stations have been equipped to burn oil, a substantial part of which is obtained from tank bottoms.

One of the first common-carrier shipments of importance sent over the Illinois trunk-line system was delivered to it through the Oklahoma Pipe Line Co.'s 6-in. line out of the Louden field.

Then, in 1937, the Wabash Pipe Line Co., a subsidiary of the Pure Oil Co., built a combination 10-in. and 8-in. line from Noble, in the Clay City area, to the Illinois main-line station at Martinsville. This line was 10-in. to the crossover at the

Texas-Empire line. Part of the oil was thereby sent southeast to Lawrenceville.

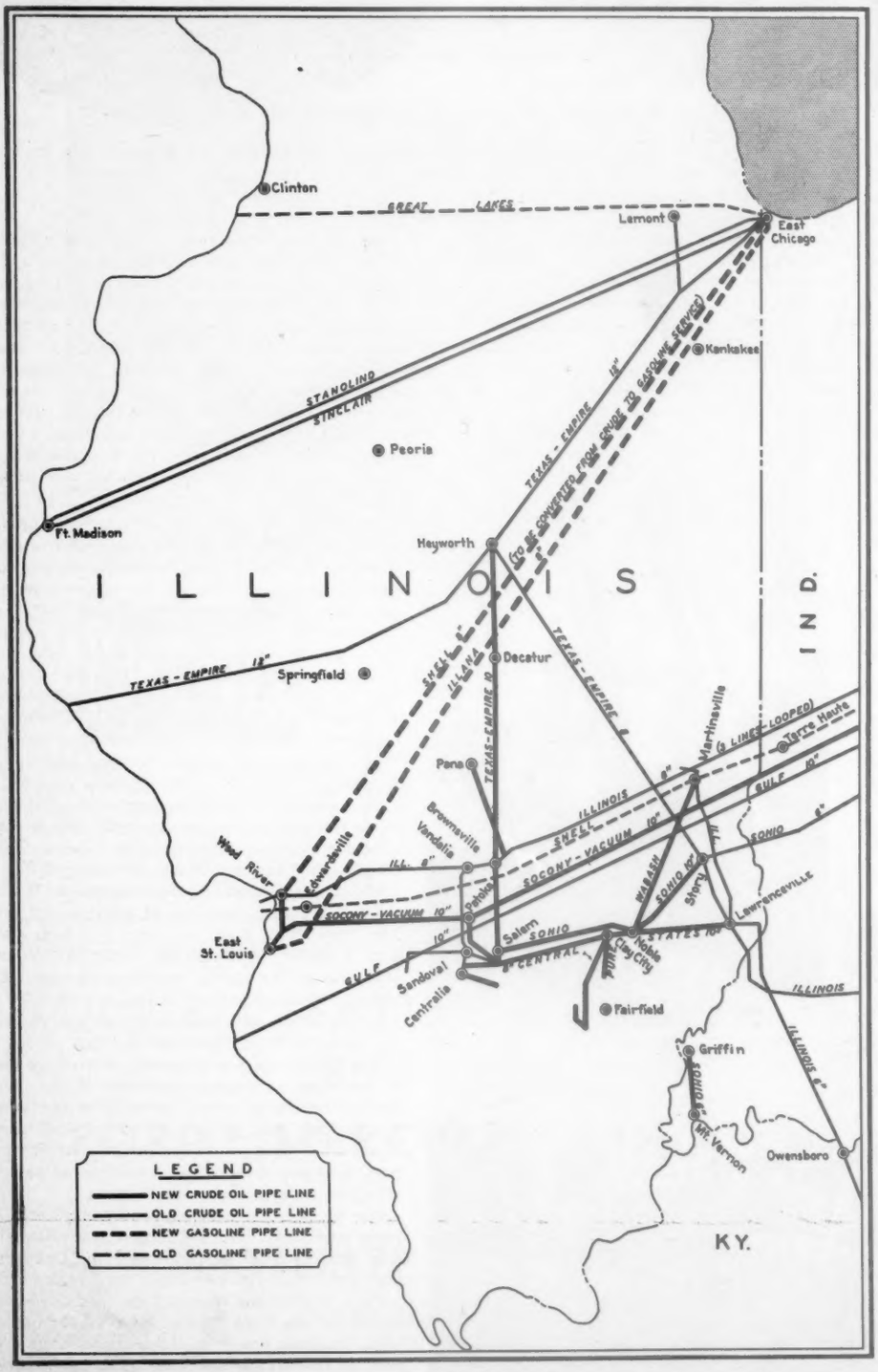
Standard Oil Co. (Ohio) then acquired about 10 miles of 6-in. line known as Owensboro Pipe Line, which was delivering oil from a gathering system in the Salem-Lake Centralia field to the Illinois line at Sandoval which in turn transported it to the Illinois main trunk line at Brownstown.

Standard of Ohio Influences

Standard Oil Co. (Ohio) has built a number of other short lines in the fields which are not tied in with any trunk line. Since January 1938 the company has been the largest purchaser of crude in the basin. At the present it is buying 47,000 bbl. per day. On July 1, 1939, it took over the 6-in. line of the Tide Water Pipe Line Co. from Stoy, Ill., to a point beyond the Pennsylvania State line. Since that time a 75-mile 10-in. line has been started from Salem to Stoy, connecting with the trunk line acquired from Tide Water. A 30-mile, 6-in. line was also built this summer from Griffin to Mount Vernon on the Ohio River where oil is loaded on barges. The Standard Oil Co. (Ohio) system is now operating under the name of Sohio Pipe Line Co., and includes the old Tide Water line, and lines of subsidiaries such as Owensboro Pipe Line Co. and Clay City Pipe Line Co.

At present, Standard Oil Co. (Ohio) is delivering 35,000 bbl. to the Illinois pipe line; 10,000 bbl. through the old Tide Water trunk line to refineries at Cleveland, Lima, and Toledo, Ohio, and it is also loading 2,000 bbl. on barges at Mount Vernon for shipment to Covington, Ky., where it has a 10,000-bbl. refinery.

Sohio Pipe Line Co.'s Louden station for shipping oil to Brownstown, Ill.



Map showing oil lines in Illinois and new construction since discovery

Gulf's Pipe-Line Position

Although the trunk line of the Gulf Refining Co. (pipe-line division) traverses the active sector of the basin in fairly close proximity to the new fields, no connections have been made in Illinois; it has not been used as a pipe-line outlet because it is utilized entirely for the transportation of Mid-Continent oil.

New Socony-Vacuum Line

The most important pipe-line development in Illinois this year has been the construction of the 357-mile 10-in. crude line for Socony-Vacuum Oil Co., Inc., by the Magnolia Pipe Line Co. from East St. Louis, Ill., to Lima, Ohio. The line has a capacity of 50,000 bbl. per day when operating at 700-lb. pressure. Oil from the Salem-Centralia fields is delivered through a 10-mile 10-in. line to Patoka station on the main line where the stream is divided into shipments going west to refineries at East St. Louis and Wood River and shipments east to the Buckeye Pipe Line at Lima, Ohio, where it is shipped north and east to the Socony-Vacuum refineries at Trenton, Mich., and Buffalo, N. Y. Due to the fact that deliveries can be made both east and west the line can serve as an outlet for 100,000 bbl. per day. Shipments westward can ultimately reach Chicago through Shell Pipe Line Corp.'s 8-in. line from East St. Louis. In addition to the construction of new lines, several stations have been added on old lines to increase their capacity. In one case, the Texas-Em-

Sturdy AND *Efficient* PUMPING UNITS FOR SHALLOW PRODUCTION

AN ILLINOIS APPLICATION
One of the many "Oilwell" TC-8 Pumping Units in service.

UNIT	TC-5	TC-8
Polished Rod Capacity . . . (lbs.)	5000	8000
Peak Torque Capacity . (in.-lbs.)	22,500	38,600
Over-all Gear Ratio	32 : 1	42.15 : 1
Maximum Stroke . . . . . (in.)	24	30

THE new "Oilwell" TC-5 and TC-8 Twin-Crank Pumping Units give efficient and trouble-free performance, like big "Oilwell" Units, at very low installed-cost. Here are a few of their features:

1. Extreme simplicity.
2. Four-leg, derrick-type samson post welded to rigid, widespread, portable steel base.
3. Double-reduction speed reducer with single-helical gearing and tapered roller bearings.
4. Oilbath, bronze-bushed saddle and upper pitman bearings; self-aligning roller bearings on crank pins.
5. High over-all gear ratio facilitates use of inexpensive, high-speed prime mover.
6. Universal slide rails provide convenient mounting for various prime movers.

Ask for complete specifications.

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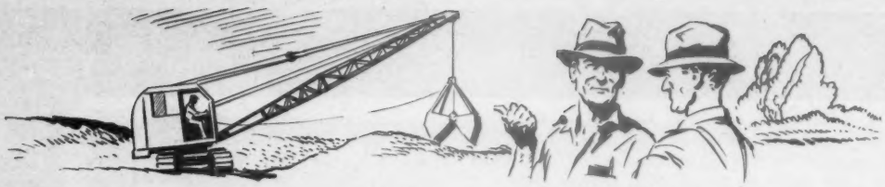
Branch Stores in All Oil Fields

Subsidiary of United States Steel Corporation

"OILWELL"



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P&H EXCAVATORS

Yes, these "P&H's" cover a lot of territory in their daily work in the oil fields. They're here on a pipe line job today, in the next county handling structural steel tomorrow, and off to dig a slush pit the day after. Day in, day out, on all sorts of jobs, their tractor-type crawlers carry them over soggy banks or choking, sandy soil with the speed and safety of a tractor. And loaded on their special, rubber-tired trailer they travel from job to job at normal driving speeds. They're convertible, too—alloy steel attachments for crane, dragline, shovel, trench hoe, skimmer scoop or pile driver make changeover in the field a fast and easy task. Send for information on the size which interests you. Harnischfeger Corporation, 4527 W. National Avenue, Milwaukee, Wis.

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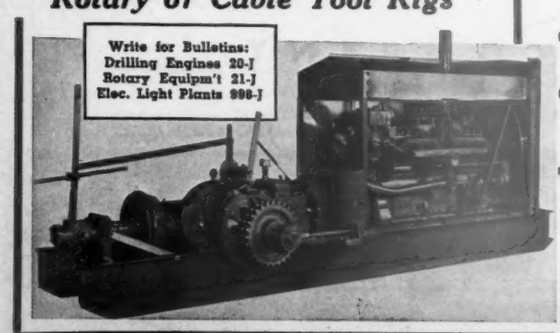

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pire line from Heyworth to Lawrenceville, the direction of shipment was reversed. Oil is now being delivered into this line at Lawrenceville by Central States for later delivery to Lockport and Chicago.

Gasoline Pipe Lines

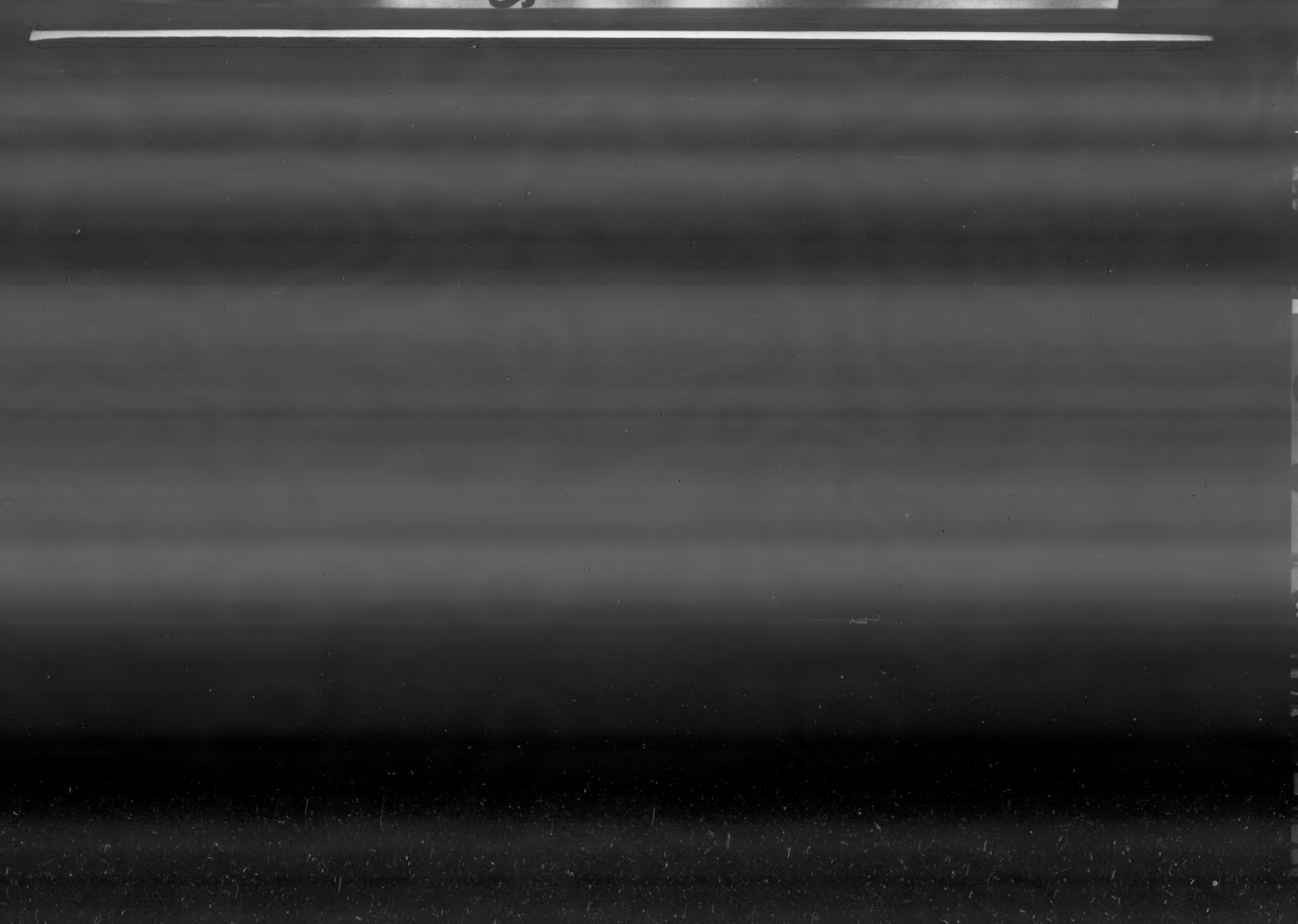
Although gasoline lines do not handle products directly from the Illinois basin, economic factors in the situation favored the construction of such lines across the state last year and this year. In 1938 Shell Pipe Line Corp. built a 418-mile 8-in. line from East St. Louis to Lima and Springfield, Ohio. It has a capacity of 20,000 bbl. per day. In September 1939 the Illana Corp. completed a 252-mile 8-in. line from Dupo, Ill., to East Chicago, Ind., with a capacity of 25,000 bbl. per day. This line makes it possible for its owners to sell gasoline in important marketing areas

Above: Central States Pipe Line Co.'s Salem station. Below: Illinois Pipe Line Co.'s Brownstown station which has steam equipment and uses tank bottoms for fuel

where competitors have refineries supplied with crude by pipe lines.

The construction work on lines recently built in Illinois has been done by contractors from Kansas, Oklahoma, and Texas. One noticeable characteristic of these lines is that all stations are compact. Most new stations are equipped with units consisting of centrifugal pumps driven by diesel engines.

Cable-tool machine completing a well in Louden field, Fayette County, Illinois. Wells are shot and then cleaned out before being placed on production



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FULL GAUGE HOLE because: there is 50% more rolling contact on wall of hole to preserve gauge . . . all gauge surfaces hard-faced with Hughesite to insure long life . . . geometry of construction keeps cones at full gauge even as wear progresses. . . .

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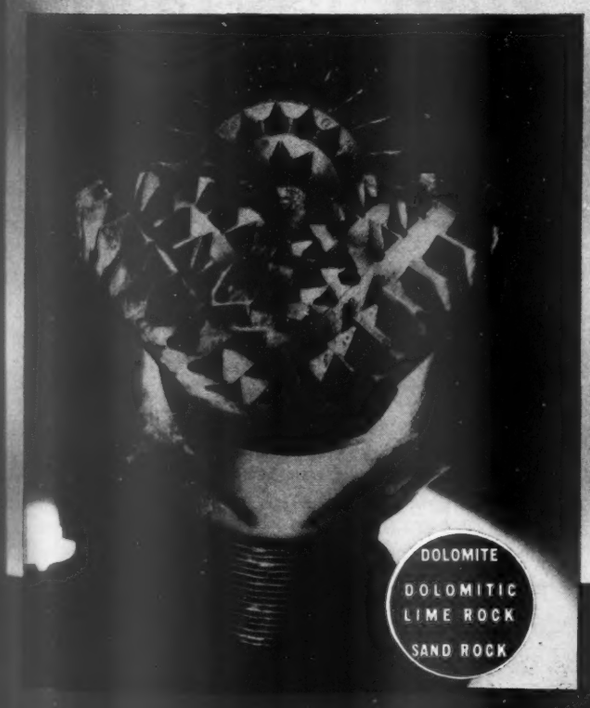

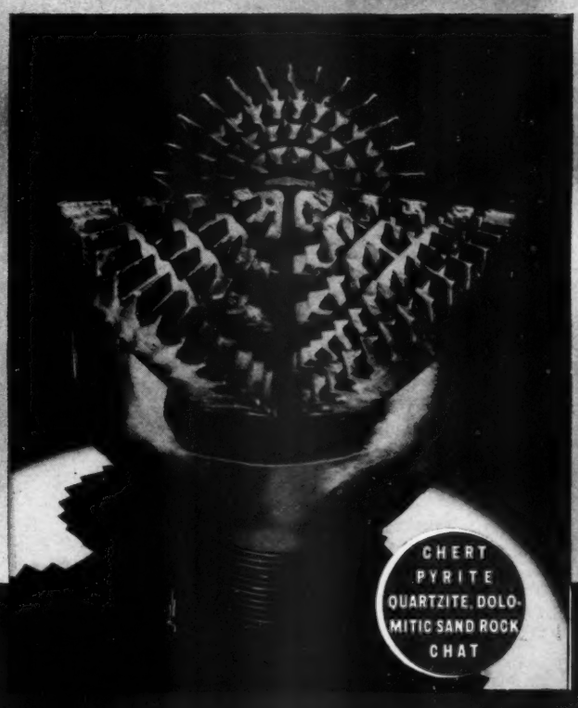

Personalities in the Illinois Basin

(1) Lymon Dennis, Pure Oil Co. geologist; Dave Roche, Bud Merrill, Claude Voyles, Albert D. Lee, Evan Davis, Bill Cross and Ed Mathews, all interested in the drilling of the Roche & Voyles and others' No. 2 Lee. (2) C. R. Groff, office manager, Pure Oil Co., and Tuck, the Pure mascot.

(3) Mark L. Terry, division engineer, and W. C. Kneale, division superintendent, Texas Co. (4) John Peters, plant superintendent, and L. L. Urquhart, secretary and treasurer, Egyptian Refining Co. (5) Frank Volger, superintendent, and Dean Henderson, Sohio Corp.

(6) Art Woerheide and Holmes Miller, district engineers, exploitation department, Shell Oil Co., Inc. (7) Jess H. Hengst, geologist; S. M. Allison, scout, Big 4 Oil & Gas Co.; C. E. Taggert, superintendent, and Justin D. Lees, secretary, Big 4 Oil & Gas and Southwestern Oil & Gas companies; H. F. Gibson, Gibson & Jennings Drilling Co., and John R. Hermes, president, Big 4 and Southwestern Oil & Gas companies.

JOHNNY'S ON THE SPOT

Back-patting can turn into finger-pointing in a jiffy when per barrel pumping cost is being analyzed from the auditor's cold report.

If the finger points at you—fairly or otherwise—YOU are on the spot, whether or not your name is Johnny.

However, those very cost figures that sometimes paralyze the back-patting hand can also point the way for Johnny to get off the spot, and to stay off permanently.

Go over the figures again, well by well, and judge them in the light of the conditions that exist in each well and the *type of pump* being used.

In each case where the cost of downtime due to pulling the pump, pump repair, or replacement seems out of line it may pay to use a different type pump or one of different material.

While you are doing this, remember that Axelson manufactures a *complete* line of plunger pumps to meet every known well condition—and that for 46 years the Axelson line has been constantly improved to meet changing requirements.

In or near practically every pumping oil field there is a stock of Axelson plunger pumps, pump parts, and pumping accessories.

Talk to an Axelson field man or write to our nearest office—we will promptly send the facts about the Axelson pumps that are being successfully used to cut pumping costs under the same conditions that exist in your troublesome wells.

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AXELSON
PLUNGER PUMPS
A TYPE FOR EVERY CONDITION

Personalities in the . . . Illinois Basin

(1) I. W. Fox, petroleum engineer, and C. I. Holliman, assistant superintendent, Salem district, Texas Co. (2) W. D. Morgan, tool pusher, Lee Drilling Co. (3) Rex Shaver, district clerk, and J. T. Davis, material foreman, Salem district, Texas Co.

(4) Verner Jones, geologist, Magnolia Petroleum Co., Mattoon, Ill. (5) Bart De Laat, division engineer, and Lynn K. Lee, division geologist, Pure Oil Co. (6) Fred Jensen, Carl Vickers, Jim Cook, Winston Connaway and Dean McDaniel, of W. C. McBride, Inc., staff at Centralia.

(7) Glenn C. Thrasher, resident geologist, Salem district, Texas Co. (8) J. S. Grosshart, Gulf field foreman, St. Elmo district.

Service on New Fields

Griffin Field, Illinois-Indiana

Compiled by The Oil and Gas Journal

GENERAL INFORMATION

Approved name:
Griffin oil field.

Geographical location:
South part of Wabash County, Illinois, and north part of Gibson County, Indiana; extends across the Wabash River which is the boundary line between the two states. The field lies in parts of Townships 2 and 3s, Ranges 13 and 14w.

Principal towns and cities near the field:
Griffin and Evansville, Ind., and Grayville, Keensburg, and Mount Carmel, Ill. Griffin had a population slightly in excess of 200 at the start of the development but has expanded to about 1,000 population; Keensburg had a population of 350 but it also has grown. Evansville is the largest city in the area having a population of approximately 125,000; Mount Carmel listed 8,000 population before the start of development and Grayville had a population of 2,000.

Cities and towns in which supply stores are located:
As there has been practically no development in this area for a number of years, new supply stores had to be built to augment those in existence at Princeton, Ind., and Lawrenceville, Ill. New stores are located at Keensburg and Grayville, Ill., and New Harmony and Griffin, Ind. Supply stores in the central part of Illinois are drawn on for supplies not carried in stock.

Railways serving the area:
The C. C. C. & St. L. runs through Keensburg, Cowling, and Grayville, and the Illinois Central runs through Griffin and Grayville and thence northward.

Character of roads:
Roads leading to the field are good generally although the area covered by the field is mostly river lowland. There are two ways to get to the field from Evansville, U. S. Highway 41 to Indiana 68 and thence to junction of 68 and Indiana 66, or Indiana 66 directly out of Evansville. At junction of Indiana 66 and 68, turn northward on gravel road and follow it into the field.

Hotels and other accommodations:
The hotel accommodations at Mount Carmel are good but inadequate. Evansville affords the nearest point at which a traveler is assured of obtaining a room and it is best to make a reservation. Mount Vernon, Ill., is used by a large number of field men but its hotels are generally full to overflowing.

Trucking companies:
Trucking companies mostly have their main offices in Salem or Clay City, Ill., but maintain branches in the towns near the field. Grayville, Keensburg, and Griffin are headquarters for several concerns having trucks capable of handling the largest oil-field equipment.

Electric and power companies:
In the field, there is no electric current to be purchased and no gas system. The smaller towns all have electric current but some of them use wood or coal for fuel. The larger towns have both gas and electricity although the former is generally high.

DEVELOPMENT

Fitzpatrick and Hayes completed their No. 1 Cooper, SE NW NE Section 13-3s-14w, during the latter days of 1938 for an initial of 870 bbl. from the McClosky lime at 2,983 ft. The well was not given an initial test for several days as there was no pipe line available and tankage was soon filled. Heavy rains started in January and for the next several months the entire area was flooded and drilling wells in the area experienced many difficulties. After the flood subsided, more wells were completed and Sohio Corp. began laying a line into the new discovery. The area was looked upon with some misgivings as a typical lime discovery and development was not rapid. When the Lacey No. 1 Cooper, SW SW SW Section 18-3s-13w, was completed for 250 bbl. initially at 2,490 ft. in the Cypress sand, interest increased and an active campaign to both horizons got under way.

Completions to date:
There were 47 completions on a recent count of the field but several good wells have been completed since then. At the time of the counting, there were nine drilling wells in the area with one of them located in the Wabash River bed.

Future activity:
The total producing area will probably cover approximately 2,000 acres with 1,300 acres of that already developed. Part of area has been held up by litigation but that is being cleared up and it will probably be exploited in the near future. The presence of several pay horizons makes the area very attractive to some while others are inclined to be pessimistic because of the uncertainty in both the McClosky and Cypress due to lack of porosity in the former and shaling out in the latter. There may be extensions to the area which will keep activity alive for a considerable period.

Companies owning leases:
Continental Oil Co., Phillips Petroleum Co., Lewis Production Co., Papoose Oil Co., Bander Oil Co., Lacy Oil Co., and a host of smaller independents are interested in the area.

Speed of drilling:
The first wells drilled in the area required almost a month but this time has been steadily reduced until it is now possible to drill the hole to the casing point in about 10 days with a rotary rig. The McClosky wells are generally completed by the rotary method but the Cypress wells are drilled in with a spudding machine.

Character of mud:
The Pennsylvanian shales make some mud but the Chester series is composed mostly of sand and limestones which do not increase the weight of the mud greatly. Fortunately, little difficulty is experienced in making the hole stand up and formations generally are tight and circulation is seldom lost. Mud is carried as light as possible to about 1,700 ft. and it is then gradually heavied to 10.2 lb. per gal.

Slush pumps:
Most of the rigs have only one power-driven slush pump. Size of the pumps varies with the individual rig from 10-in. to 14-in. stroke and size of pistons varies from 6¼ to 7½ in. in diameter.

Water supply:
The Wabash River runs through the heart of the field and it has several tributaries that run close to or through the field; there is ample supply of water for drilling fluid and for use in boilers.

General geology:
There is a major trend of folding running from the northeast to the southwest across Wabash County, Illinois, and Gibson County, Indiana, and the Griffin field is located on a crossfold on this major feature. The anticline plunges to the east with a closure of 225 ft. in a little more than a mile. The closure to the west is not so abrupt. The McClosky generally has very good porosity but is typical in that it is spotty and the porous section has been absent in some wells. The Cypress sand is generally well developed and has good porosity and permeability except in spots where the sand is absent, being replaced by shale.

DRILLING

Derricks:
Most operators in the area have used 96-ft. derricks although a few have used the taller 125-ft. structures. The derricks are gen-

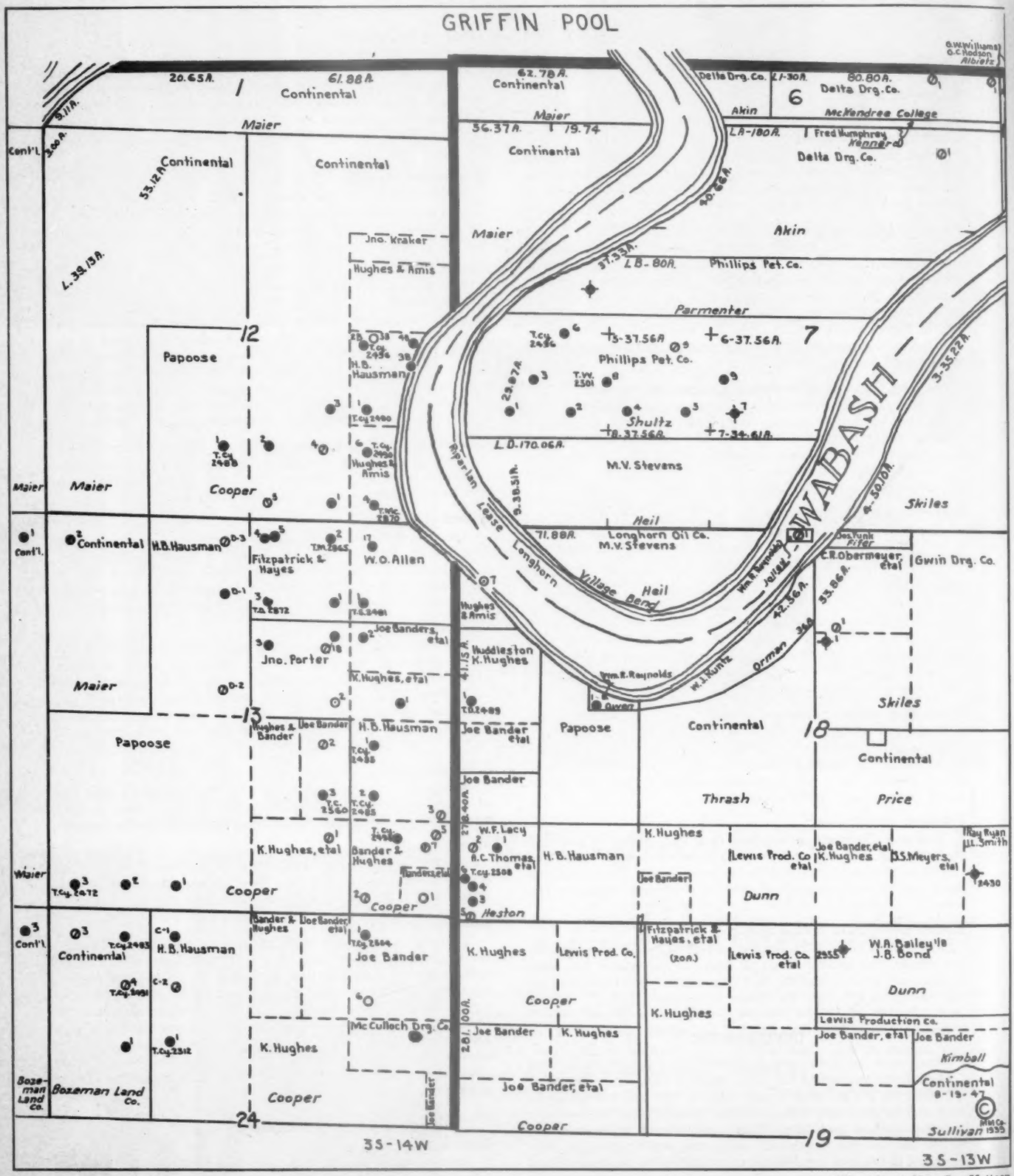
erally removed immediately following the conclusion of the drilling with the rotary.

Type of drilling equipment used:

The first well in the field was drilled and completed with rotary tools and they have been used exclusively to drill the major portion of the hole. Most of the rotaries are light, power-driven rigs, although a few steam rigs have seen service in the area. The McClosky wells are completed with the rotary rig but the Cypress wells are generally completed with a spudding machine. There are about 15 rotary rigs operating or ready for operation in the field and in addition there are many more at work in surrounding fields located on the same general trend.

Fuel:

Mechanical rigs generally use gas from the McClosky or Cy-

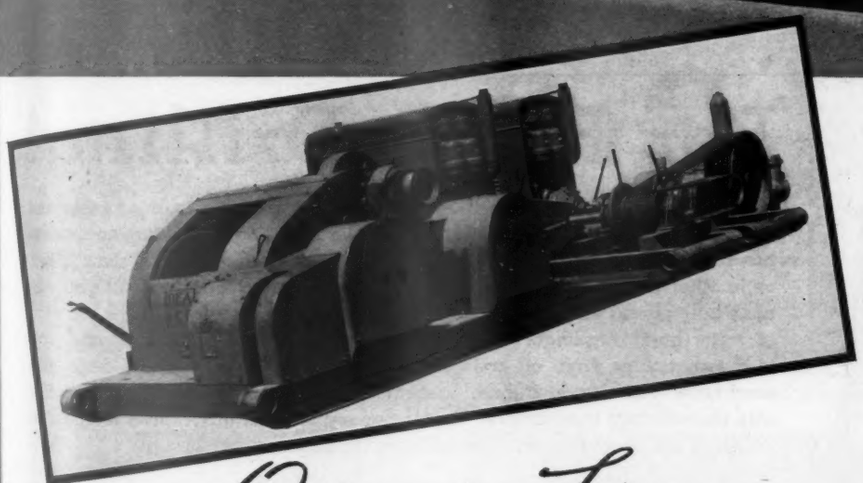


Midcontinent Map Co., Mattoon

Griffin field, Wabash County, Illinois, and Gibson County, Indiana

NATIONAL'S

New TYPE 50 CONSOLIDATED RIG



THE IDEAL Type 50 Consolidated Rig is designed to accommodate two internal combustion engines having a 350 hp maximum combined output and for drilling operations not to exceed 5,000 feet with 4½" drill pipe. The rig incorporates a draw works with chain-type transmission having a gear reverse. Provision is made for compounding the two engines so that the combined power may be applied for hoisting, or for the rotary and slush pump requirements when drilling.

SOME OF THE *Outstanding Features* THAT IMPROVE OVER-ALL DRILLING EFFICIENCY

- Six Hoisting Speeds
- Three Rotary Table Speeds
- Friction Master Control Clutch
- Friction Clutches for High Speed Hoisting and Rotary Drives
- Alloy Steel Shafts
- Oil Bath Lubrication
- Friction Clutches for Engine Compounding and Pump Drives
- Sand Reel (Optional)

NATIONAL

THE NATIONAL SUPPLY COMPANY

EXECUTIVE OFFICES: PITTSBURGH, PA.
GENERAL SALES OFFICE: TOLEDO, OHIO

DIVISION OFFICES: FT. WORTH, TEXAS;
TULSA, OKLA.; TORRANCE, CALIF.

press wells when it is available but most of them are convertible to gasoline, butane or diesel fuel. Boilers are fired with crude oil.

Size of hole and casing program:

Generally a 12¼-in. hole is drilled to about 200 ft. and 10¾-in., 32.75-lb. per ft. surface casing run; the hole is then reduced to 8¾ in. or 7⅞ in. with either 7-in., 17-lb. per ft., or 5½-in., 14-lb. per ft. casing being run to below 2,400 ft.

Type engines:

Gas, gasoline, butane or diesel engines vary in size from 60 to 160 hp. depending on the particular rig. These are generally arranged so both engines can be compounded for making trips but in some cases the pump and its driving motor are located some distance from the hoist and its motor.

Type of bits and stems:

Because the Pennsylvanian and the Chester series contain considerable hard rock, the drilling is entirely with rock bits. First wells in the area required more bits than expected but holes are now being drilled with fewer than 10 bits, but they sometimes require as many as 18 bits.

Tubing used:

Operators are generally using 2⅜-in. o.d., 4.7 lb. per ft. H-40 tubing; no exceptions to this practice are noted.

PRODUCTION PRACTICE

Methods of producing oil:

Wells are flowed through tubing until they begin to decline and then are placed on the pump. Proper location of tubing and conservation of the gas energy are important in prolonging the flowing life of the wells. The McClosky pay has more gas than the Cypress but neither has enough gas to make a long flowing life possible. Pipe-line outlets for the oil are insufficient and the production must be restricted or excessive tankage erected.

Separators and tankage:

A wide variety of tank batteries may be seen in the field with some operators having batteries of from six to eight 500-bbl. tanks and others using four 110-bbl. tanks. Separators are small but are used generally. Due to the flood conditions, which cannot be controlled, pumping units, separators, and tank batteries are either built on steel platforms or on earthen mounds. Pumpers and gagers may have to use boats to get to the wells and tank batteries.

Pumping conditions:

Pumping from the McClosky lime presents very few problems; the Cypress generally holds up well and during the early life of the wells the working barrels are not sand cut to any great extent; common working barrels are generally used but later it may be necessary to use insert-type working barrels in some of the wells. The wells generally make just enough gas to make the valves pound if the stroke of the pump is not properly adjusted. The leases are generally not large enough to warrant an installation of a power. Individual pumping of the wells is performed with a unit capable of a 9,000-lb. polish-rod load with a peak torque of 57,000 in.-lb. driven by a 10-hp. internal combustion engine.

Water conditions:

No definite water table has been established but the Cypress sand contains varying amounts of connate water. Treating is not yet a problem but several heaters have been installed.

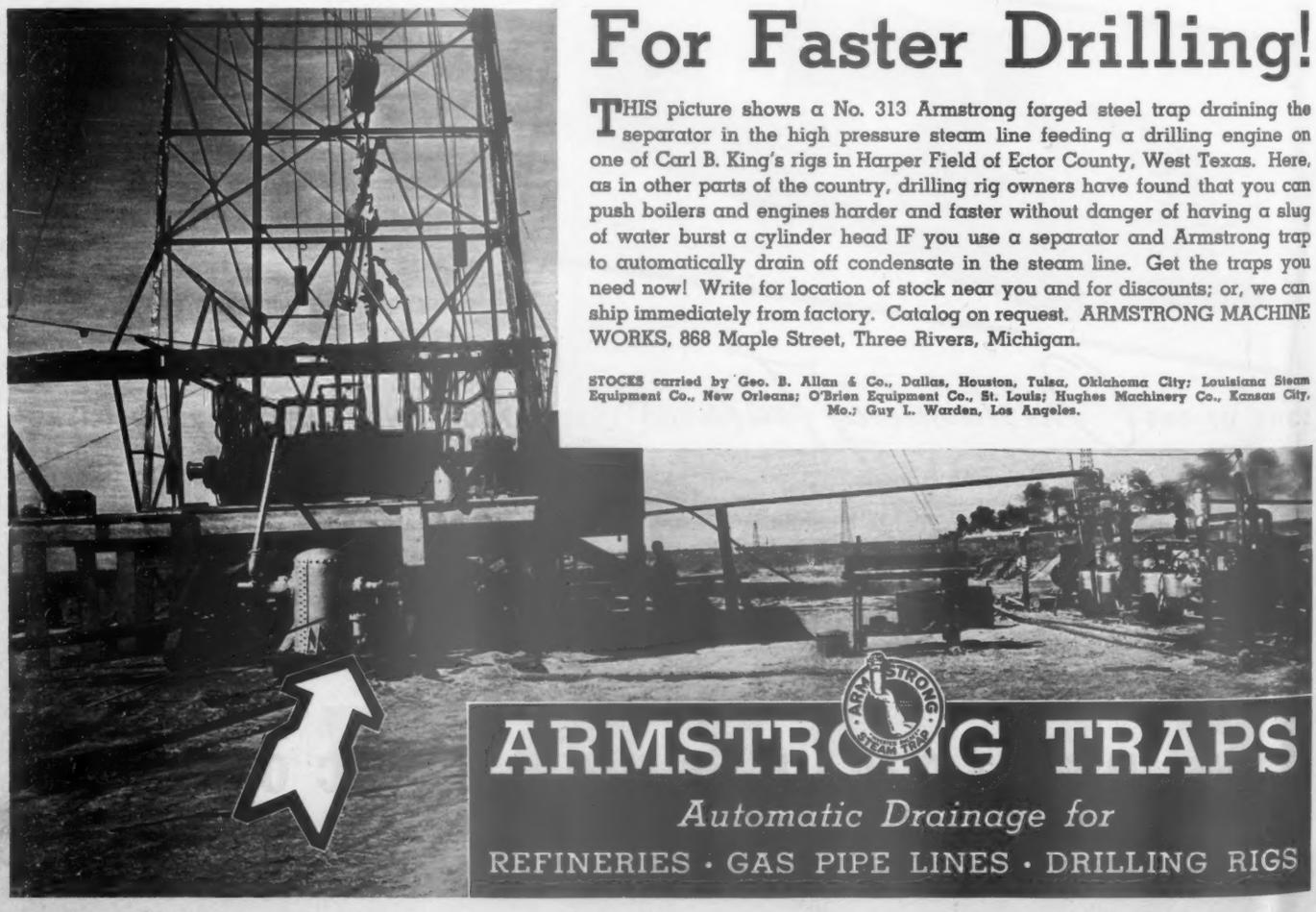
Shooting and acidizing:

The lime wells are generally acidized with from 2,000 to 3,000 gal. while the sand wells are shot with from 20 to 60 qt. of liquid nitroglycerin.

GENERAL DATA

Outlet for the oil:

No pipe lines were in the area at the start of the development, although a gathering system was in existence in the older Illinois fields some miles to the north. The first oil was hauled out in trucks but Sohio Pipe Line Co. installed a 4-in. line to a loading rack and later constructed a 6-in. line to Mount Vernon, Ind., where it is building a loading terminal for shipment up the Ohio River. J. E. Amos has a 4-in. line into the town of Griffin where there is a loading rack. Merrimac Pipe Line Co., Sohio, and Hertzog Refinfing Co. are the principal purchasers in the field.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THIS picture shows a No. 313 Armstrong forged steel trap draining the separator in the high pressure steam line feeding a drilling engine on one of Carl B. King's rigs in Harper Field of Ector County, West Texas. Here, as in other parts of the country, drilling rig owners have found that you can push boilers and engines harder and faster without danger of having a slug of water burst a cylinder head IF you use a separator and Armstrong trap to automatically drain off condensate in the steam line. Get the traps you need now! Write for location of stock near you and for discounts; or, we can ship immediately from factory. Catalog on request. ARMSTRONG MACHINE WORKS, 868 Maple Street, Three Rivers, Michigan.
STOCKS carried by Geo. B. Allan & Co., Dallas, Houston, Tulsa, Oklahoma City; Louisiana Steam Equipment Co., New Orleans; O'Brien Equipment Co., St. Louis; Hughes Machinery Co., Kansas City, Mo.; Guy L. Warden, Los Angeles.
ARMSTRONG STEAM TRAPS
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Automatic Drainage for
REFINERIES · GAS PIPE LINES · DRILLING RIGS

General construction view of new Houdry catalytic cracking unit at the East St. Louis refinery of the Lubrite division, Socony-Vacuum Oil Co., Inc.

Lubrite Houdry Unit to Process Illinois Oil

THE finding of substantial quantities of crude oil in Illinois, coupled with the advantages obtained from catalytic cracking, had considerable bearing on the plan worked out by the Lubrite management whereby they could add to their present refinery operation a Houdry catalytic cracking unit especially designed to process 16,000 bbl. per stream day of Illinois crude.

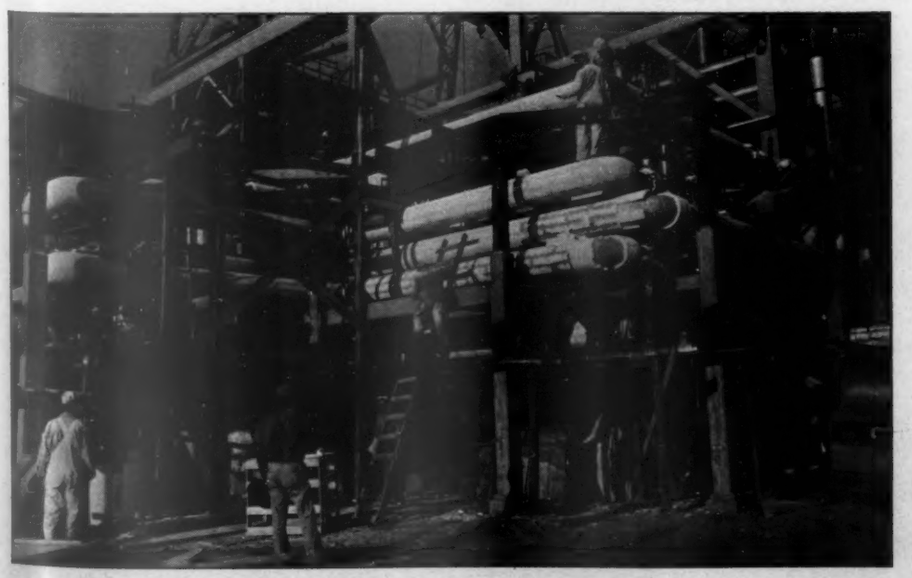
The unit now under construction by E. B. Badger & Sons Co. is similar in principle to several other like units now in operation or being erected at various Socony-Vacuum refineries, and deviates from their design only where it was necessary to adapt the catalytic operation more efficiently to Illinois crude. The completion of construction and the commencement of operation are anticipated to be some time during the month of December 1939.

The 16,000-bbl. unit will be operated to produce straightrun gasoline, straightrun kerosene, catalytic gasoline, No. 2 fuel, No. 3 fuel, and a nominal amount of heavy fuel and gas.

For ease in describing the unit, it is advisable to divide it into its component parts, which are listed below in the order of their operating sequence beginning at the crude oil entering.

Crude Topping

The crude will be stripped of its straightrun gasoline and kerosene in conventional topping equipment. Heat to this section will be supplied as far as possible by means of heat exchange, and the deficit will be made up by a pipe still. The gasoline will be taken overhead, kerosene as a side stream, and the bottoms pass into the tar separator.



Applying insulation over the pipes serving the new Houdry unit

Tar Separation

The bottoms from the topping operation are charged through a furnace and flashed into a tar remover. The heavy fuel created by flashing leaves the base of the apparatus for storage, and the overhead will be transferred in the vapor form to be utilized as charging stock for the catalytic cracking cases.

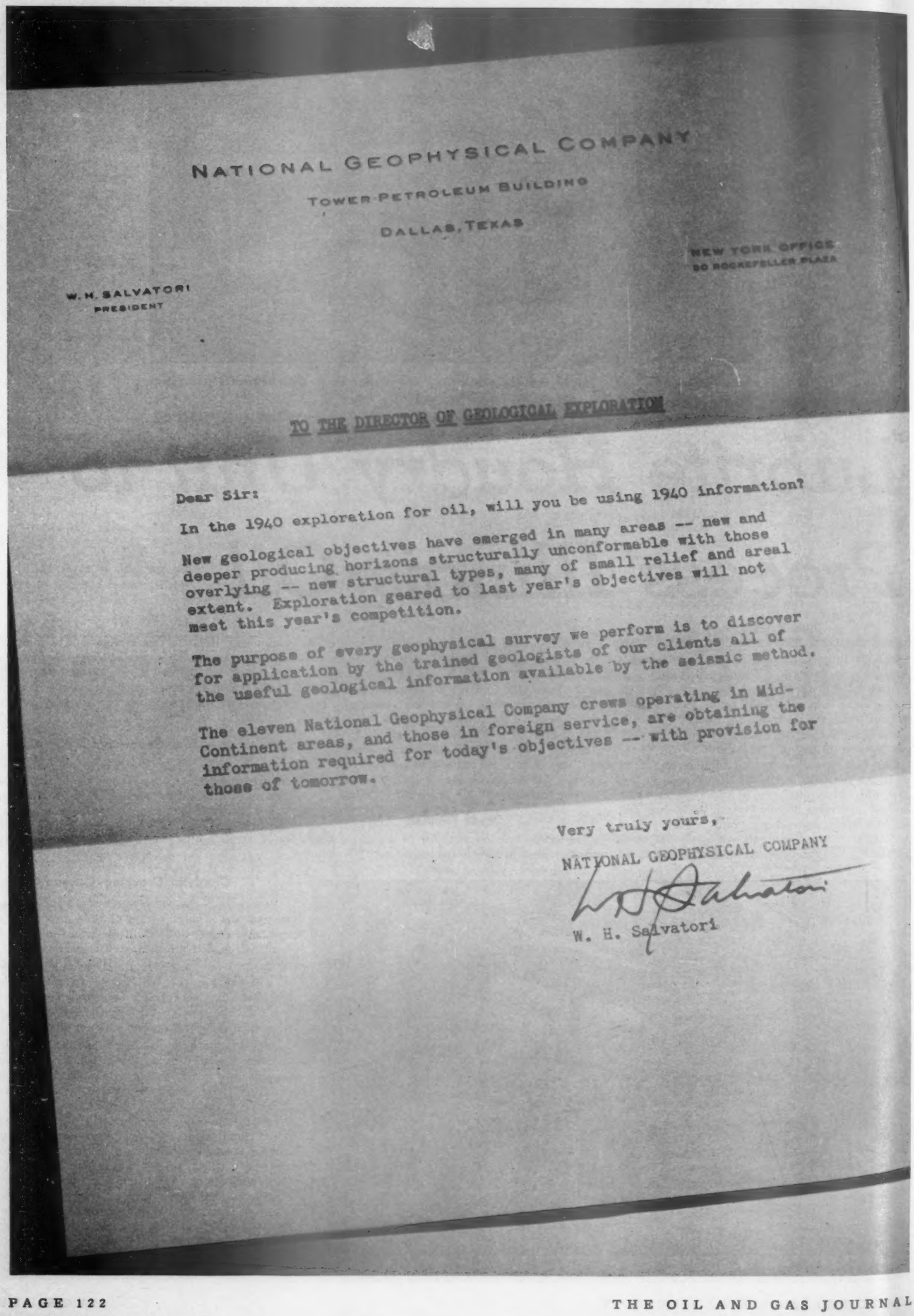
Catalytic Cracking Cases

Vapors from the tar separator will contact the catalyst for a short period of time, producing a synthetic crude which will be transferred to a fractionator for condensing and separation.

The catalyst containers are six in number; and at any one time two will be on stream, two in the early stages of being regenerated, and two more will be passing through the last stages of regeneration prior to going back on stream.

Regeneration is an exothermic, oxidizing operation, accomplished by the use of high-pressure air developed by a rotary compressor. The hot gases resulting from regeneration will be carried through a turbine. The turbine is the prime mover of the compressor and will produce more power than is required by the compressor. The surplus power thus produced will be absorbed by means of an electrical generator. The three pieces —i.e., compressor, turbine and generator—are connected mechanically.

The reactions that will take place within the cases will be kept well in balance by means of a circulation medium composed of low-melting, high-boiling salts. By the use of exchangers, heat will be removed from the salt cycle and trans-



NATIONAL GEOPHYSICAL COMPANY

TOWER PETROLEUM BUILDING

DALLAS, TEXAS

NEW YORK OFFICE
30 ROCKEFELLER PLAZA

W. H. SALVATORI
PRESIDENT

TO THE DIRECTOR OF GEOLOGICAL EXPLORATION

Dear Sir:

In the 1940 exploration for oil, will you be using 1940 information?

New geological objectives have emerged in many areas -- new and deeper producing horizons structurally unconformable with those overlying -- new structural types, many of small relief and areal extent. Exploration geared to last year's objectives will not meet this year's competition.

The purpose of every geophysical survey we perform is to discover for application by the trained geologists of our clients all of the useful geological information available by the seismic method.

The eleven National Geophysical Company crews operating in Mid-Continent areas, and those in foreign service, are obtaining the information required for today's objectives -- with provision for those of tomorrow.

Very truly yours,

NATIONAL GEOPHYSICAL COMPANY

W. H. Salvatori

ferred to incoming crude and also to water evaporators for the production of steam.

The cyclic operation of the cases will be carried on by means of motor-operated valves controlled by an electrical cycle timer.

Synthetic-crude vapors from catalytic cracking cases will be condensed and separated in this apparatus. The overhead product will be catalytic gasoline, and the bottom product will be distillate-fuel oil which has virtually the same characteristics as the uncracked case charge. The noncondensable gas and cracked gasoline will be transferred to stabilizing equipment.

The stabilizer and absorption apparatus is conventional in design, consisting of an absorber, fat-oil stripper and stabilizer. Gases from the synthetic-crude fractionator will pass through the absorber; and the resulting absorption gasoline, in conjunction with the gasoline from the synthetic-crude fractionator, will be brought to vapor pressure in the stabilizer.

By the installation of the catalytic unit the output of the Lubrite refinery will be substantially increased. The unit is so designed that the average man available in the refinery is quite capable of its manipulation. The automatic features of the unit have reduced manual operation to a minimum. These features have been made possible only by good engineering on the part of the general designers of the unit in conjunction with equipment manufacturers.

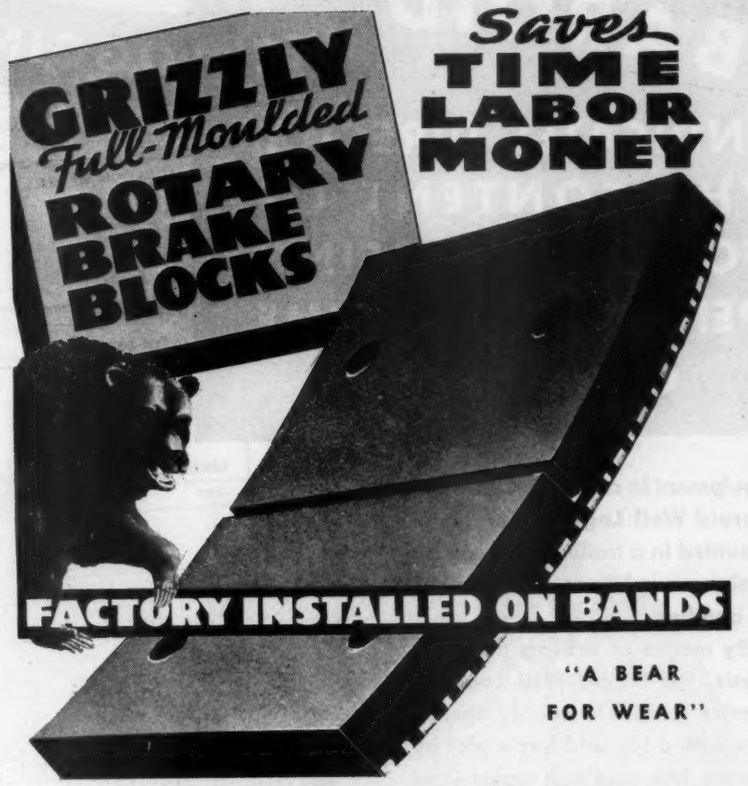
Refinery Sets an Impressive Safety Record

BECAUSE an employe was injured when he used a babbitt hammer without wearing safety goggles, in direct violation of safety regulations, one of the most impressive no-accident records ever made in the petroleum industry recently was interrupted. An average 1,570 employes in the mechanical department of Standard Oil Co.'s (Indiana), Whiting, Ind., refinery, during 15½ months from May 14, 1938, to August 28, 1939, worked without a single lost-time accident for a record total of 3,856,724 man-hours of safe operation.

This record is believed to be unmatched in petroleum-industry history, and is regarded as particularly noteworthy because of the diversity and hazard of the routine and special jobs handled by the mechanical department under Supt. R. F. Storer. In its regular line of work the department meets the principal hazards of combined craft groups including boilermakers, blacksmiths, carpenters, pattern makers, pipe fitters, masons and cement finishers, insulators, electricians, welders and burners, and common laborers and apprentices in many of these trades.

During the 15½-month period, the company's report states, many special jobs were undertaken, besides the regular maintenance work. These included extensive dismantling and replacement of obsolete equipment, including several heavy-pressure vessels; reconditioning and replacement of combination cracking units, which incurred the added dangers of night work; major extensions in the sewage and water systems, and additions and repairs to the power system—both steam and electric; and fabrication and erection of several storage tanks.

The Whiting mechanical department previously (October 1, 1936, to November 29, 1937) had set a safety record of 3,312,824 hours. In addition, the company reports the setting of three other no-lost-time records: 3,358,568 safe hours by all departments of the Whiting refinery; 1,583,402 hours by all departments of its Sugar Creek refinery; and 2,928,425 hours by the entire manufacturing department of the company, covering 5,770 employes in all refineries from April 19 to July 17, 1939.



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SERVICE

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BAROID WELL LOGGING SERVICE

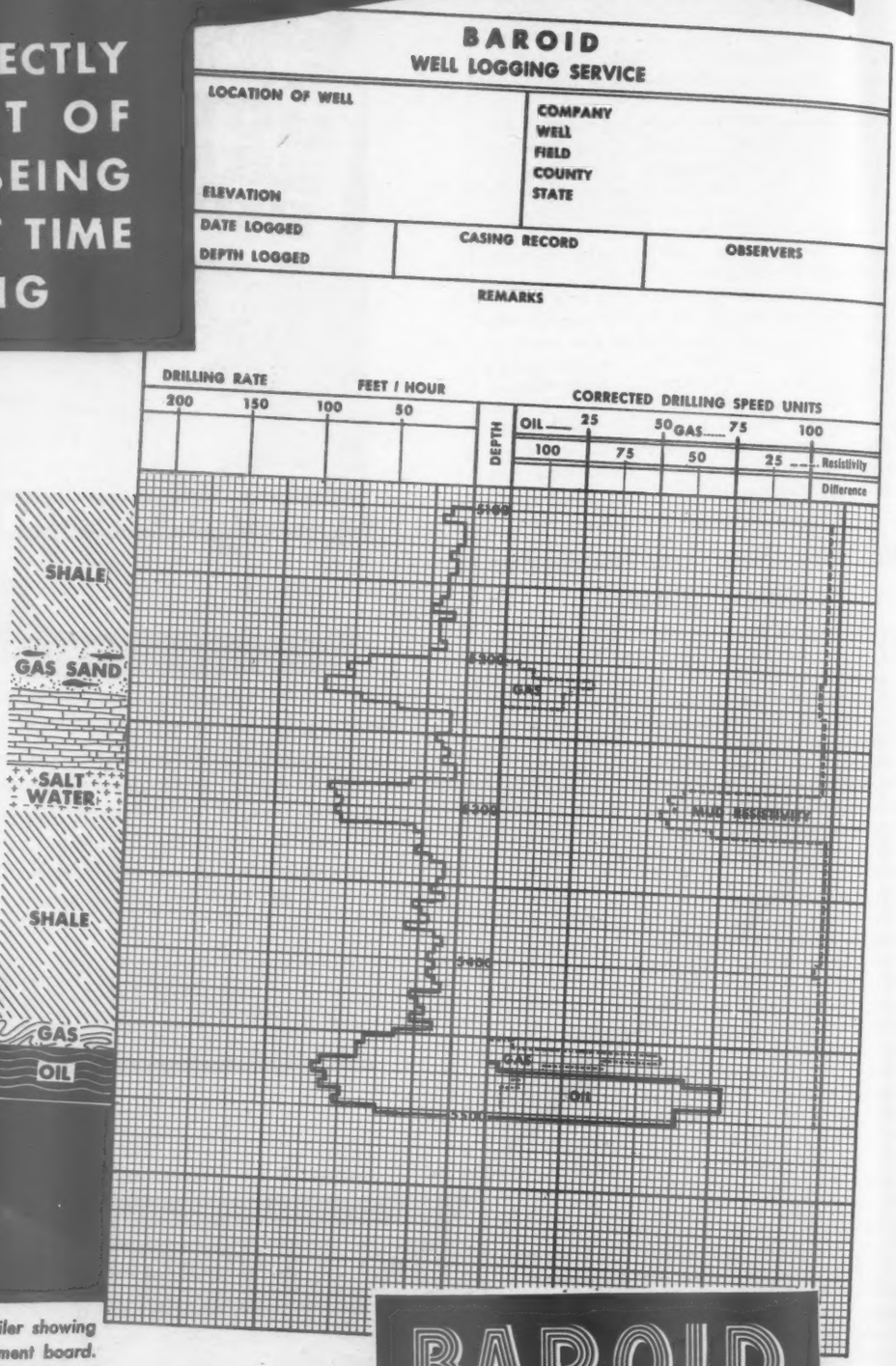
INDICATES DIRECTLY THE CONTENT OF FORMATION BEING PENETRATED AT TIME OF DRILLING

Equipment in connection with the Baroid Well Logging Service is mounted in a trailer which can be easily moved from one location to another.

By means of drilling mud analysis, the Baroid Well Logging Service is able to supply operators with a log which is a plot of the oil, gas, and salt water values, bit penetration rate, and formation data from bit cuttings.

This information is obtained right at the time of drilling and without interruption of regular drilling operations. Illustrated literature furnished on request.

Interior view of Baroid Well Logging Trailer showing operator recording data from main instrument board. Shown are instruments recording values of gas and salt water, and oil detection apparatus, pump stroke counter and meter, and depth meters.



BAROID SALES DEPARTMENT
NATIONAL PIGMENTS & CHEMICAL DIVISION OF
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BAROID SALES OFFICES: LOS ANGELES • TULSA • HOUSTON

BAROID WELL LOGGING SERVICE
FORMATION INFORMATION THROUGH MUD ANALYSIS

Illinois Refining Operations

(Continued from Page 53)

prices for crude at the wells have been lower than in the Mid-Continent, accounts for the growth in petroleum refining.

MIDDLE WESTERN REFINERIES

Illinois

Company and plant location—	Crude oil cap.	Cracking cap.
Advance Refining Co., Inc., Centralia	2,000	....
Allied Oil Corp. of Ill., St. Elmo	4,000	2,000
Art Goodson Refining Co., Sandoval	1,000	....
Basin Oil Refining Co., Centralia	2,000	....
Calumet Refining Co., Burnham	1,200	....
Cascade Refining Co., Salem	3,000	*1,000
Centralia Refining Co., Inc., Centralia	2,000	....
Central Illinois Oil & Refining Co., Central City	2,000	....
Cross Co., Henry H., Dupo	1,000	....
Egyptian Production & Refining Co., Centralia	2,500	....
Globe Oil & Refining Co., Lemont	16,500	3,000
H. S. & B. Refining Co., Mill Shoals	1,200	....
Indian Refining Co., Lawrenceville	18,000	7,500
Lake Refining Co., Salem	2,000	....
Mathews Refining Co., St. Louis, Mo.	3,500	....
Mid-States Refining Co., Joliet	1,000	....
Northern Refining Co., St. Elmo	750	....
Ohio Oil Co., Robinson	10,000	5,000
Pana Refining Co., Pana	3,500	1,750
Red River Refining Co., Burnham	1,000	....
Shell Oil Co., Inc., Wood River	65,000	29,500
Socony-Vacuum Oil Co., Inc., East St. Louis	20,000	2,200
Standard Oil Co. (Indiana), Wood River	20,300	6,410
Taxman Oil Co., Milan	1,500	....
Texas Co., Lockport	27,000	19,600
Wabash Refining Co., Sandoval	1,000	....
Worth Refining Co., Blue Island	8,000	....
Total	220,950	77,960

*Building.

Indiana

Cities Service Oil Co. (Del.), East Chicago	30,000	18,000
Evansville Refining Co., Inc., Evansville	2,000	....
Johnson Refining Co., Gary	2,000	....
Shell Oil Co., Inc., East Chicago	30,000	21,000
Sinclair Refining Co., Inc., East Chicago	40,000	30,000
Socony-Vacuum Oil Co., Inc., (Wadhams division), East Chicago	11,800	3,900
Standard Oil Co. (Indiana), Whiting	112,100	44,200
Troy Refining Corp., Troy	250	....
Total	228,150	117,100

Kentucky

Aetna Oil Service, Inc., Louisville	3,500	2,000
Ashland Oil & Refining Co., Catlettsburg	9,000	4,200
Louisville Refining Co., Inc., Louisville	5,000	2,500
South Kentucky Pipe Line Co., Somerset	350	....
Standard Oil Co. (Ohio), Covington	8,000	4,600
Stoll Oil Refining Co., Louisville	2,000	....
Texas Co., Pryse	3,000	2,500
Tri-States Refineries, Inc., Spottsville	800	....
Total	31,650	15,800

Ohio

Canfield Oil Co., Cleveland	1,500	....
Canton Refining Co., Canton	2,500	1,500
Gulf Refining Co., Cincinnati	18,000	8,000
Gulf Refining Co., Toledo	18,000	7,000
Lima Crude Refining Co., Findlay	700	....
National Refining Co., Findlay	3,200	1,300
National Refining Co., Marietta	700	....
Pure Oil Co. (Heath Ref.), Newark	11,000	9,000
Pure Oil Co., Toledo	15,000	13,000
Standard Oil Co. (Ohio), Cleveland	21,000	7,800
Standard Oil Co. (Ohio), Lima	7,500	2,700
Standard Oil Co. (Ohio), Toledo	17,000	9,200
Sun Oil Co., Toledo	14,000	10,000
Total	130,100	69,500

Personnel of New Illinois Basin Refineries

Advance Refining Co., Centralia, Ill.—J. J. Taxman, president; Maynard Taxman, secretary and treasurer; Milo W. Taxman, sales manager; B. H. Lynn, superintendent.

Allied Oil Corp. of Illinois, St. Elmo, Ill.—A. R. Matthews, president; L. B. Stableford, vice president; V. A. Allen, assistant secretary; W. H. Rice, Jr., secretary and treasurer; C. L. Withers, superintendent.

Basin Oil Refining Co., Centralia, Ill.—A. R. Matthews, president; L. B. Stableford, vice president; W. H. Rice, Jr., secretary and treasurer; C. W. McCormick, superintendent.

Cascade Refining Co., Salem, Ill.—J. C. Potter, president; A. B. Potter, vice president; M. E. Austin, secretary; W. W. Plowman, superintendent.

Centralia Refining Co., Inc., Box 464, Centralia, Ill.—A. F. Grohe, president; O. H. Butler, Jr., secretary; Jack Stribling, superintendent.

Egyptian Production & Refining Co., Centralia, Ill.—Perry T. Fess, president; John Peters, vice president; L. L. Urquhart, secretary and treasurer; John Peters, superintendent.

Evansville Refining Co., Inc., Evansville, Ind.—P. H. Hertzog, president; Leo Givins, secretary.

Lake Refining Co., The, LaSalle Building, Salem, Ill.—John G. Lane, president; L. R. Eddy, vice president; John Kraker, secretary and treasurer; Fred Williams, superintendent.

Mathews Refining Co., 9738 South Broadway, St. Louis, Mo.—R. G. Matthews, president; L. R. Flori, vice president; Cecil Brown, secretary and treasurer; Walter Maness, superintendent.

Pana Refining Co., Pana, Ill.—Chase Savage, president; George M. Pfau, vice president; George Edward Day, secretary; Fred H. Luers, treasurer; George M. Pfau, superintendent.

Tri-State Refineries, Inc., Spottsville, Ky.—A. J. Slagter, president; Earl B. Paulson, vice president; A. J. Slagter, Jr., secretary; R. Hal Compton, treasurer; A. J. Slagter, superintendent.

Taxman Oil Co., Milan, Ill.—E. S. Taxman, president; Earl C. Roff, superintendent.

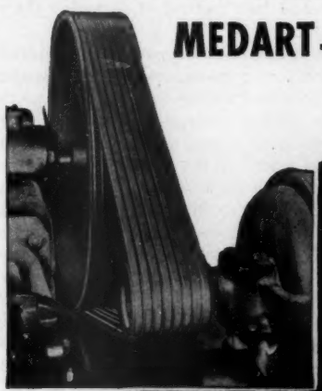
Troy Refining Corp., Troy, Ind.—Auburn Stinson, president; C. D. Schreiber, vice president; Dewey Stinson, secretary and treasurer.

A NEW OIL FILM

The Bureau of Mines has brought up to date its films on the oil industry, which are now available for public showing. No. 99 gives the story of gasoline; No. 120, the story of lubricating oil; No. 151, automobile lubrication; No. 153, evolution of oil.

Additional prints of film Nos. 113, 114 and 115 visualize a journey through the oil lands of Europe and Africa.

MEDART—*for "Power-Travel at Reduced Rates"*



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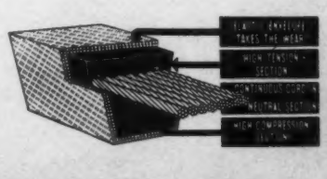
Medart V-Belts have a long flexible life. A belt may "feel flexible," but it is not a success unless it has long life. The belt must be a balance between groove-gripping action, tensile strength, wrapper life and cool running characteristics. Medart Groove-Grippers have this balance of characteristics.



THE MEDART COMPANY

3524 DeKalb Street • • St. Louis, Mo.

MEDART

Pure Uses Novel Method of Suspending Rod Lines

BOTH lime and sand wells in the Illinois basin decline rapidly to the point where they must be put on the pump soon after completion, and consequently one of the major producing problems in the area is economical lifting of the oil by mechanical means. Pure Oil Co., still one of the largest producers in the basin, the first major company to make a discovery in the area and the oldest in point of experience, has adopted the centrally geared power and jack method of obtaining their production.

Left, top: Flowing well with under-pull jack installed. Running of rods is all that is necessary to put the well on the pump. Center: One of the swings which is used to help balance the powers. The rod line makes approximately a 90° turn at this point. Bottom: One of the geared powers pumping 21 wells having a production of over 3,000 bbl. per day. At one time this power handled 6,000 bbl. daily

At the present time that company has 28 geared powers in operation in the Central basin fields and have the plan outlined for the installation of more powers as its drilling program progresses. The operation of powers on such a large scale has led to an intensive study on the part of Pure's engineers, and they have made several innovations in pumping by this method. One of the most unusual features introduced is a new-type rod-line carrier which reduces friction losses and increases the efficiency of the pull lines. It was designed by Pure's engineering staff.

Pure has confined its activity to what has become known as the "basin fields," because they are located for the most part in the deepest part of the basin. Principal among these is the huge Clay City field, where there is a total of about 340 wells with a daily production of 22,500 bbl. Pure operates over 300 wells in this field and has a daily average production of approximately 21,500 bbl. Because it owns most of the acreage in a solid block, Pure has been able to develop the field gradually and to produce it in an efficient manner, due to its not being forced by offsets to take oil when it would damage the wells and the reservoir. The solid blocking of the Clay City field has been particularly favorable to power pumping, although the spacing plan followed, one well to 20 acres, causes the pull-rod lines to be unusually long in some cases if each power is to pull the maximum number of wells.

The Clay City and the Cisne fields were discovered practically simultaneously, March 1937, although neither of the discovery wells was completed in the zones which later proved to be the main producing horizon in each area. The Cisne discovery produced from the Aux Vases, while the Clay City discovery produced from the Cypress. Discovery of oil in large quantities in the McClosky lime (Ste. Genevieve) took place in May 1937.

McClosky Principal Producing Horizon

The McClosky is the principal producing horizon in the Clay City field and is an oolitic zone in the Fredonia lime in the Ste. Genevieve formation. The average pay thickness in the area is 12 ft., with the producing zone being encountered shortly after drilling to 3,100 ft. According to Lynn K. Lee, division geologist, Illinois producing division, Pure Oil Co., Olney, Ill., the Clay City field typifies the relation of structure to accumulation in the majority of the limestone fields of the basin area. "In this field there is slightly over 50 ft. of closure, and all of the area within the closure is not productive. This is due to lack of porosity in the limestone within a large northeast-southwest-trending tight zone, traversing diagonally across the axis of the structure." (Guide Book, thirteenth annual field trip, Kansas Geological Society.)

Some very good wells have been completed in the McClosky zone in the Clay City field, with the initial production topping 1,500 bbl. per day in many of them. Completion pressures often exceed 400 lb. per sq. in. Gas-oil ratio, based on open flow, is nearly 2,500 cu. ft. per bbl. A back pressure is kept on the pumping wells to conserve the gas energy, and it is partly to conserve the gas that operators do not attempt to prolong the flowing life of the well.

No spacing pattern is followed for the location of the powers, as adjustments can be made in the

Below: A nearly frictionless rod-line carrier made from hardwood timbers and junk sucker rods. Upright supports move freely

Above: In action the rod-line carriers swing to and fro and one production man facetiously remarked that they reminded him of a ballet. They are 90 per cent more efficient than the usual doll heads

pull-rod lines to take care of any well not directly in line. For the most part, the wells are drilled on a regular 20-acre spacing. On completion of the well by acidizing through the 2-in. tubing and swabbing in with the rotary, the drilling rig is removed and the location cleared up. The concrete foundation for the pumping jack is poured while the well is still flowing through the tubing. The jack, pull-rod lines, and the power are installed preparatory to putting the well on the pump. When the well ceases to flow, only the ⅝-in. sucker rods need to be run to start the pumping operation. No cleaning out of the well is necessary.

The geared powers are all similar and installations are generally uniform, the only variations being those to meet local or unusual conditions. The geared powers are single-crank construction, with an adjustable stroke and double-reduction gear with a ratio of 20.9 to 1. It has positions for 20 well connections, but with little additional equipment the capacity of each power can be increased to 30 wells. Bearings for the pull rods are 3½-in. in diameter.

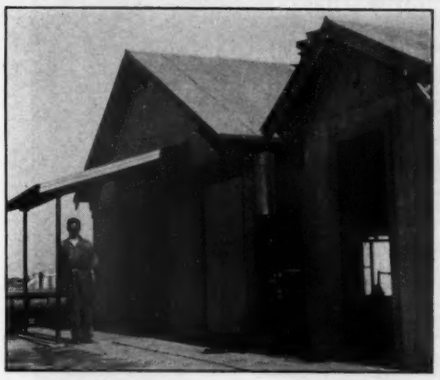
Dimensions of Power

Overall dimensions of the geared power are 6 by 7½ by 4 ft. The powers are set in concrete pits about 10 ft. square and 3 ft. deep; shaft for driving the power is in a concrete-walled trough. Both the pit and the trough are enclosed with a special sectional steel cover, which is held together by thumb screws. The power and drive shaft are easily accessible for greasing or maintenance work. The powers are operated at 15 to 25 s.p.m., with the production varying from 3,000 to 6,000 bbl. daily.

Engine for driving the power is housed in a steel building, 20 by 24 ft., with concrete floor; steel grids are provided for covering the underfloor shafting and the piping which may require attention. Driving engines, one at each power, are twin-cylinder, 12½ by 15-in. gas engines rated at 100 hp. at 220 r.p.m., or 150 hp. at 310 r.p.m. Gas for fuel is furnished by the producing wells, from 100 to 200-lb. per sq. in. pressure being kept on the main gas system through the field; the pressure on the engine-fuel system is kept constant by means of a regulator and volume tank, the latter being located overhead within the building.

Increase in the speed, and consequently in the horsepower of the engines, was accomplished by an oil-cooling system developed by Pure engineers. Oil is forced through the drilled crankshaft and connecting rods against the interior of the pistons; the heated oil is passed through a special section of the water cooler before it is returned to the sump after passing through a filter. This system increases the efficiency of the engines as well as increasing the speed at which the engine may run.

Location of the cooler for the water jacket is inside the building, with air being admitted through a screen section in the wall. Air stream through the cooler is regulated by doors which are located in the side of the building in front of the cooling ele-



Top, left: Piston end of engine showing connections for special oiling system which cools the pistons and makes it possible to increase the speed and horsepower of the engine. Above: Storage, filter and sump for the special oiling system on one of the engines at a Pure Oil Co. power. Left: Main power building is made from steel and is approximately 20 by 24 ft. Regulator for gas line and volume tank for air compressor can be seen between the main building and the smaller building used for storage

ment. It is thus possible to regulate the water temperature in hot and cool weather. Use of cooler eliminates the necessity of having a circulating tank which would require the addition of makeup water. In excessively cold water antifreeze is added to prevent damage in case of shutdown. The fan for the cooler is driven through belts from the engine shaft.

In addition to the special oil filter and sump, the engines are equipped with a special oil indicator, which shows that all parts are being properly lubricated before the safety switches are connected. Safety switches are located on the water-cooling system and on the oil system; in case of overspeeding the engine will automatically be shut down through a safety switch connected to the ignition. The engines are cranked with air, a small air compressor with driving motor being used.

Transmission Arrangement

The drive pulley on the engine is connected to the drive shaft of the power through nine V-belts; a belt tightener makes it possible to keep the proper tension on these belts at all times. The clutch rod for engaging the drive on the shaft projects through the steel grid covering the shaft.

Four hardwood supports are provided between the power and knockoff block for the travel of the flat pull rods. Beyond the knockoff block, ⅞-in. pull rods are used on short lines and 1-in. rods on lines over 3,000 ft. On most of the powers the rod lines are supported by the conventional doll heads, but if tests of the new carrier continue to prove successful, these will be replaced. Loss in efficiency increases rapidly with length of the rod line and often gets as high as 70 per cent of the input.

Dynamometer tests run on the rod lines have shown that the frictional loss when the line was supported by doll heads reached 3.81 hp. and on the same line, with the same load, the swinging straight-line rod carrier had a loss of only 0.33 hp. The losses in the latter case are less than 10 per cent of the conventional method. In one extreme case there was an overtravel of the rod line at the well instead of the undertravel normally experienced.

The new carriers are constructed from junk sucker rods and hardwood blocks. Two oak timbers, 2 by 4 in., are bolted to upright 2-in. pipes below the rod line. About 6 in. toward the center from each pipe, a ¾-in. hole is bored, into which is inserted, from opposite sides, the upright for the rod carrier. Each of these supports has a 90° bend on each end, the upper end being inserted in a hole in the hinge blocks. The actual support for the rod line is a small block placed on the swinging member. The upper end of the swinging member has a T-piece which is supported on each end by the swing blocks.

Operation of Rod Line

As the rod line travels, the uprights and the swinging member are free to travel with it and the supporting block is forced to move in a straight line, with the rod line being fully supported throughout its entire travel. The wood is lubricated at first, but a glazed surface develops, which makes an excellent bearing, wears well, and is practically frictionless. These bearings are much more efficient than the sliding of the rod back and forth across the doll head, and in actual use have required less greasing and care.

At the present time a ⅞-in. rod line 5,057 ft. in length is being used successfully with these hangers, while formerly all lines over 3,000 ft. were 1 in. in size. The increase in efficiency makes counterbalancing, to allow the sucker rods to drop in the well, unnecessary and reduces the power required on the upstroke. Wells are equipped with 2-in. tubing, ⅝-in. rods, and an underpull jack having a peak-load rating of 10,000 lb. The peak load on the polish rod is 7,500 lb. Decrease in the power required per well will make it possible to pump more wells per power, and Pure's engineers are planning on placing 31 wells on a single power.

Because the powers are installed while development is in progress, some unusual methods of balancing have been introduced by Pure production men. Pumping wells in one direction from the power may far outnumber wells in the opposite direction. To balance such wells, swings are used, the rod line starting out in one direction and then practically reversing itself to get to pump jack. In other cases, "dead men," built on skids, are used to balance the system.

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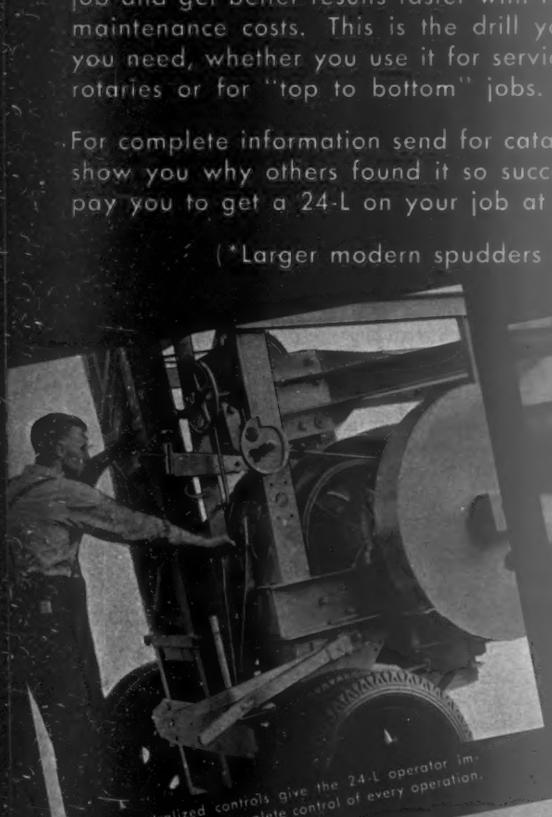
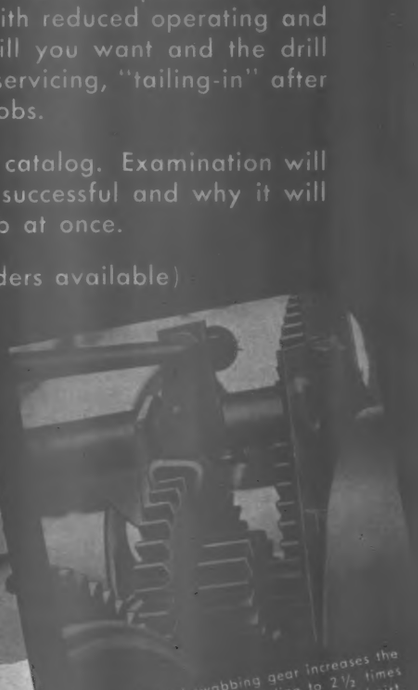


Centralized controls give the 24-L operator immediate and complete control of every operation.



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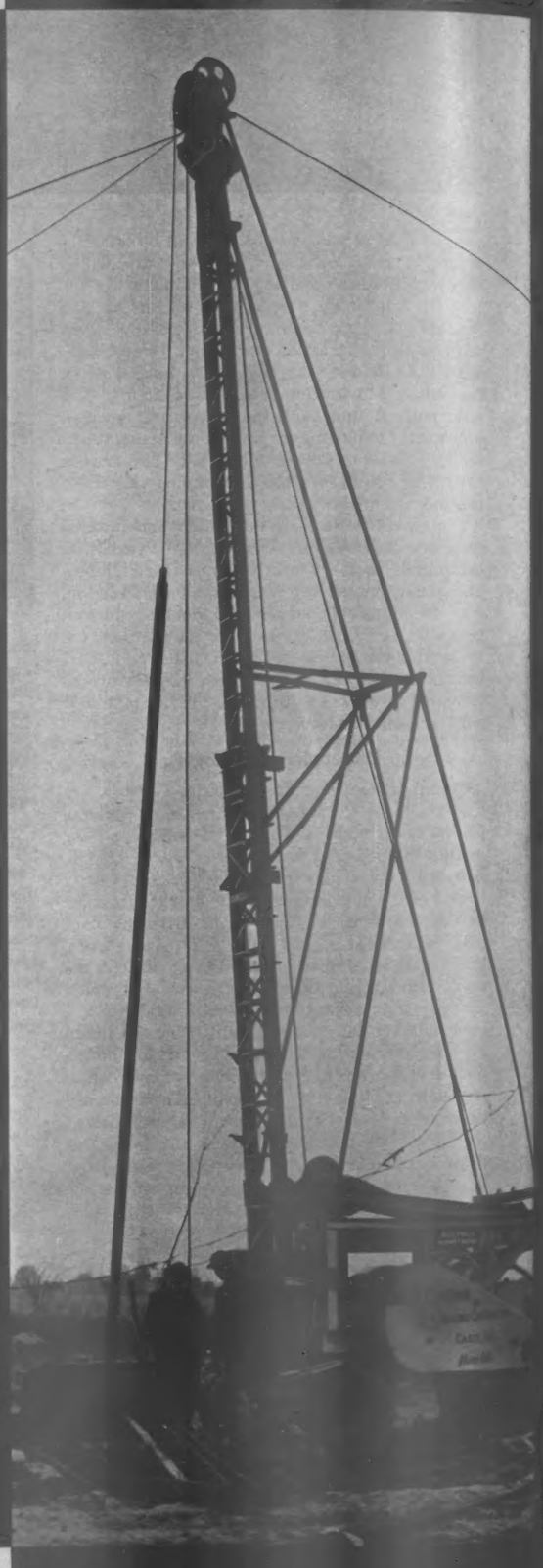

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Hard Formations Increase Well-Drilling Costs

By HARRY F. SIMONS

Expense due to unusual wearing of rotary and cable-tool bits is of such importance that the subject of hard formations is reviewed with special attention directed to conditions encountered in penetrating quartzite and other formations which retard drilling operations to an unusual extent

●

THE cost of drilling a well in a particular area is greatly dependent on the formations encountered; the number of hard formations or strata which are difficult to drill will influence the bit costs, a major item in the contractor's budget. While rock bits for rotary drilling are a greater cost item than the bits used in cable-tool drilling, excessively hard formations take a major toll in the latter type of operation.

In addition there are costs and hazards directly attributable to hard formations, including stuck strings of pipe, trouble getting in and out of the hole and excessive line or drill-pipe wear

Fortunately, excessively hard formations are not encountered regularly. Naturally, every hole drilled will penetrate some formations that are more difficult to drill than others. One of the most difficult formations to drill with a rotary rig is quartzite.

Quartzite is described as a "metamorphosed sandstone, a very hard rock composed of quartz grains which are melted by heat and pressure and recrystallized in interlocking fashion. It absorbs very little water and is much harder than sandstone. In sandstone the grains of quartz are held together by a cementing material which will break, leaving the quartz grains whole. In quartzite the breakage is across the grains.

"When pure, it is white or gray in color but due to impurities it may have shades of yellow, red, and green. The rock never cleaves along smooth lines but breaks with a conchoidal fracture. It resists weathering and in northern Michigan is responsible for beautiful surface features." (Rocks and Minerals of Michigan, p. 70.)

Quartzite Widely Distributed

Quartzite has a rather wide distribution, the main reason it is not a source of more drilling difficulties being that it generally occurs below the Ordovician in the pre-Cambrian formations. Reference to this formation may be found in many places in the bulletins of the A.A.P.G. It is reported as occurring just below the siliceous lime and just above the granite in Kay and Osage counties, Oklahoma.

Another authority writes, "From several borings, perhaps not yet quite a dozen, located either on the Balcones escarpment or not far from it on either side, samples have been obtained that are remarkably similar in lithological character. One almost comes to the conclusion that these samples represent a single formation. There is a gray quartzite-like rock of fine texture, consisting of angular grains. It is mostly indurated but in spots it is almost sandstone. The grains are never large. No pebbles are present. . . . .

"Another feature which is almost invariably constant is that the black slate, and sometimes also the fine-grained quartzite of this formation, yield strong ammonia fumes on being heated. . . . . It is evident from the core samples, especially, that the formation has been very largely affected by mountain-building forces. . . . . From the core it is evident that the strata stand at high angles where it was taken. Many slickensides and small faults are to be seen. It is believed that this formation belongs to the Huronian." (Characteristics of Some Texas Sedimentary Rocks as Seen in Well Samples, John A. Udden, A.A.P.G. Bull.)

A well being drilled by the cable-tool method in Choctaw County, Oklahoma, over 15 years ago encountered quartzite at 2,200 ft. Cable tools were moved out and a diamond core drill moved in and the well finished by that method.

A recent test in Louisiana attempted to drill deeper and after getting close to 9,000 ft. encountered considerable difficulty due to the hardness of the formations. This well was temporarily abandoned at one time but the operators decided to drill deeper with the hope the metamorphosed sand and shale were comparatively thin. The cement plug from 5,720 to 6,804 ft. was drilled and the mud conditioned before running the drill stem to 8,510 ft., total depth. After making 18 ft. of 8¾-in. hole the size was reduced to 8⅝ in. and drilling continued; the first 8⅝-in. bit run made 18 ft. but its successor had to ream a foot of the hole to get to bottom.

These photographs illustrate the effect of hard formations on bits. The two bits at the left of either photo have been cut by running in sharp or hard formations. The bit in the center above, and at right below are not so badly worn but evidently were not drilling fast enough to warrant their remaining in the hole. The other bits shown are new

Shale, sand, and lime, with sand predominating, were logged by the drillers to 8,598 ft. after which the formation was mostly hard sand; 3 ft. was the least made by any one bit and 21 ft. the greatest footage to a total depth of 8,692 ft. Drilling became harder from there, the next three bits making respectively 6 ft., 5 ft., and 3 ft.; this was followed by a sandy shale break that allowed 16 ft. to be made with one bit. The succeeding bit made 7 ft., followed by bits that made 2 ft., 3 ft., and 3 ft., after which another break allowed 10 ft. to be made with one trip. The formation then began to alternate hard and soft with a run of 6 ft. being followed by one of 21 ft.

The test reached a depth of 8,929 ft. after 25 days although the hole was very tight and several times the bit hung in the well. In all 187 sacks of artificial mud were added to keep the hole in good condition. After practically every trip, the hole had to be reamed from 1 to 22 ft. and one such occasion the entire footage of the previous bit required enlarging; a total of 138 ft. out of the 419 ft. had to be reamed, some of it several times. The test was abandoned after freeing the drill pipe which stuck at the total depth.

Drilling of the 419 ft. required 23 days or an average of 18 ft. per day. Bits required for this amount of hole totaled 37, an average footage of 11.3 ft. per bit. Each bit was run an approxiate average of 16 hours, the remainder of the time being occupied by trips and incidental repair work. Geologists watching the test credited the hardness of the formation to its metamorphic character; much of the sandstone logged by the drillers was quartzite. In many cases the bits used were worn so badly that the bearings were exposed, the formation cutting the steel quite rapidly.

A test drilled in southern Oklahoma provided an amusing incident when it encountered a 5-ft. streak of quartzite and progress practically ceased. Drillers were accustomed to reporting progress in feet and not inches; for several days each driller logged up a foot for his tour. After a few days it was evident that during the time 12 ft. were logged, less than a foot had been made; after breaking through the formation and the drilling rate increased, the footage was replaced on the log.

A test drilled in Haskell County, Oklahoma, several years ago did not hit quartzite but encountered very hard sand and lime formation. The well was drilled to a total depth of 7,003 ft. and used a total of 146 rock bits. The last 500 ft. were the most difficult, requiring 85 bits and 35 days to drill. This is an average footage of only 5.9 ft. per bit. The formation during the last 500 ft. was very similar to quartzite.

The basal Pennsylvania sand frequently is very hard, 2 and 3 ft. often being the capacity of a bit in that formation. In some Illinois fields, this formation changes from location to location, one well encountering it where it is hard and another where it is soft. As many as four bits have been required to drill 18 ft. of this formation; in other cases, the sand was noticeable only by a change in the drilling rate.

Rapid wearing of bits in hard formations is not due to any fault in the design of the bits nor to the selection of the material used. Rock bits are made in a wide variety of designs for drilling through particular formations. The passing from one to another is generally so rapid that to have the correct bit on bottom would require numerous trips. For this reason, bits are selected with the dominant formation in mind although economy will dictate the choice of a bit when a particular formation is comparatively thick.

When unusually hard formations are encountered, the bit is confronted with its most difficult task and the bit designer and builder is likewise faced with conflicting interests. In the hardness table, the following minerals are listed:

1. Talc.	6. Feld spar
2. Gypsum or salt rock.	7. Quartz
3. Calcite	8. Topaz
4. Fluospar	9. Corundum
5. Apatite	10. Diamond.

By a comparative table of alloys, it is found that steel may be made with a hardness of from 7 to 9 in the above scale. However, the bit must have other qualities than hardness, including toughness for the extreme weights and pounding which it must withstand. The rate of penetration is dependent on the speed of rotation and the weight applied to the bit; a steel of a hardness approaching the diamond would not be capable of withstanding these conditions.

There has been much argument about the proper amount of weight to use on hard formations. One driller, with 25 years' experience, summed up this subject by comparing the action of a bit on the formation with that of a knife on a grindstone. "If the knife contacts the stone lightly, it wears away rapidly while the stone is not damaged; if the knife is forced against the grindstone, the knife wears away but so does the stone."

Proper Weight on Hard Formations

There is one advantage that helps relieve some of the disadvantages accompanying hard formations. The forces that caused the formation to be hard also caused the rock to become more massive and to lose part of its bedding planes. In hard sands, limes and dolomites, the bedding planes are either indistinct or not present. The driller can apply as much weight as the surface machinery and drill pipe will withstand without much danger of the hole deviating from vertical.

The hard sands are not the only formations

(Continued on Page 138)

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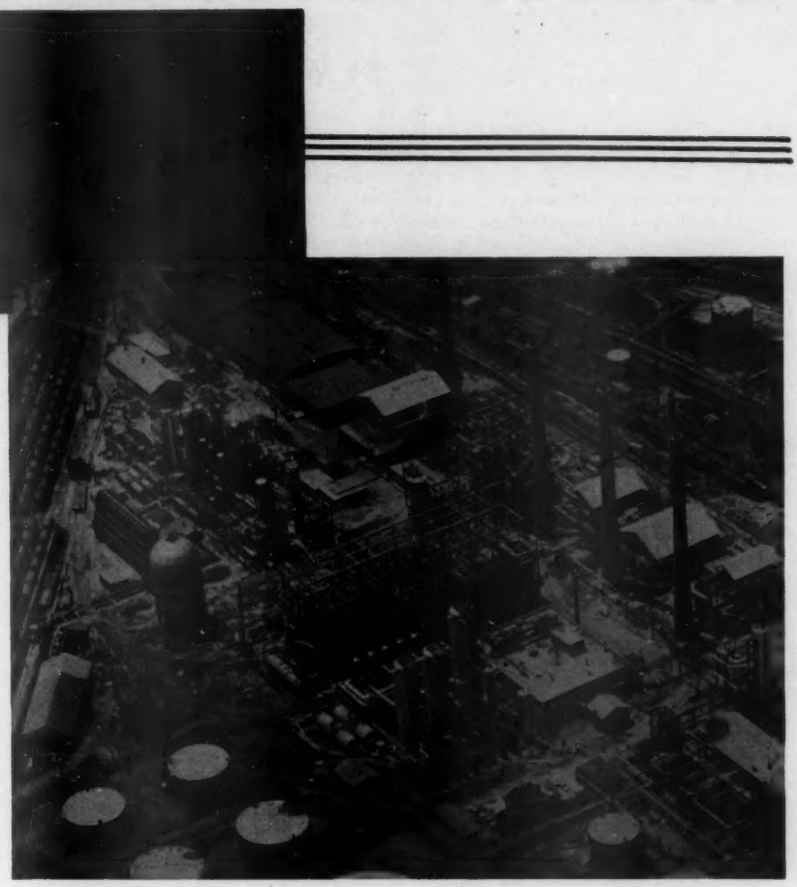

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Reaction Rates in Cracking

By W. L. NELSON

APPROXIMATE rates of cracking with time and the approximate effect of temperature on the rate of cracking have been known for many years, but not until recently was sufficient information available to permit a correlation of the cracking characteristics of the entire group of hydrocarbons that compose petroleum. Complete data are still lacking, but a start in this direction is indicated by the graph, which shows reaction velocity constants for a number of hydrocarbons, naphthas, recycle stocks, gas oil and residual stocks.

Most of the data (see references) were taken from tests which were conducted mainly for the purpose of determining the types of chemical reaction that occur during heating rather than the rate of reaction, and hence the general correlation given in the graph may be considered as an attempt to make this scattered data more useful from the standpoint of engineering design. In many respects the correlation is not as dependable as the original published data because it does not indicate the exact products of the decomposition. For information about the nature of the products, reference should be made to the original references given at the end of this paper and to similar discussions. Another factor which is of great importance is the degree or extent of decomposition that is practiced. At low percentages decomposed, the products of reaction are different from those at high percentages decomposed—particularly at amounts exceeding about 25 per cent. For this reason, and as a general engineering design fundamental, it is suggested that the reaction velocity constants here given should not be used for yields larger than 25 per cent.

Although pressure has some effect on the kinds of products that are produced, the effect is usually of little significance in this respect unless extremes in pressures are employed. Still another confusing point is the fact that the percenage of product that is produced is not always equal to the amount of charge stock that has disappeared. This difficulty arises because decomposition is not the only reaction that takes place, and thus a significant amount of material heavier than the charge stock, as well as pure decomposition products, may be produced.

In order to gain even the general correlation or picture that is presented in this article, it was necessary to skip all of these inadequacies and define the decomposition reaction as follows:

$$K_1 = \frac{1}{t}\log_e\left(\frac{a}{a-x}\right); \text{ or often } \frac{1}{t}\log_e\left(\frac{100}{100-x}\right)$$

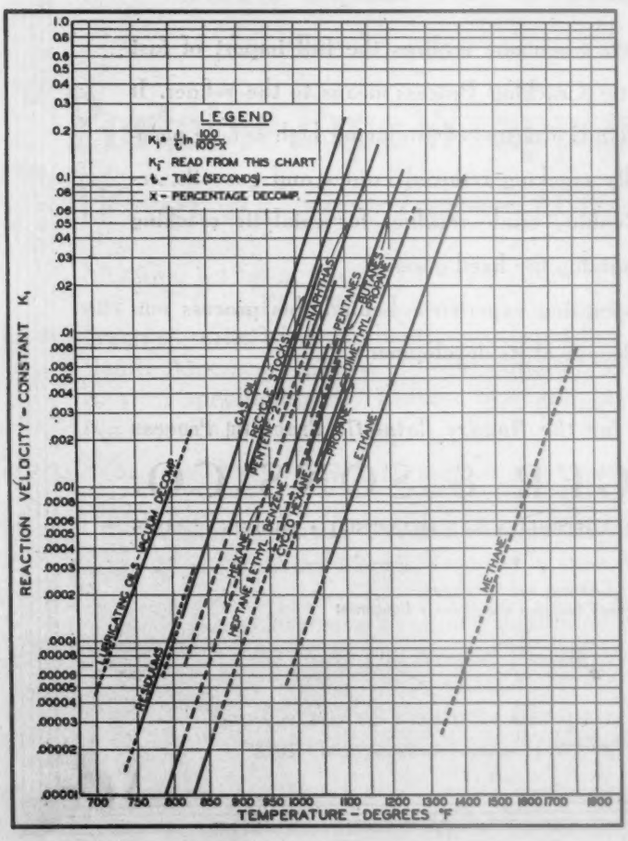
In which:

K_1 = reaction velocity constant for a pure first order reaction by which one material is broken down into two other materials. It amounts to the yield per second at the particular conditions of temperature and pressure and for the particular material under consideration.

t = time in seconds.

a = percentage of material being decomposed that is present in the feed stock. For a pure feed stock the value of a is 100.

x = percentage of material being considered that disappears during the reaction and during time t. Thus, it is either necessary to assume that all of the feed stock that disappears is changed into useful product, or to determine by a study of the particular feed stock the actual amount of product that is produced during the disappearance of one part of feed stock. Of course, the latter method is more exact and is to be preferred providing such information is available. In some instances, such as cracking, it is difficult to determine the amount of feed stock that has disappeared, and hence the x factor is commonly used as the percentage of product.


LEGEND
$K_1 = \frac{1}{t}\ln\frac{100}{100-x}$
K_1 - READ FROM THIS CHART
t - TIME (SECONDS)
x - PERCENTAGE DECOMP.
REACTION VELOCITY - CONSTANT K_1
TEMPERATURE - DEGREES °F
700 750 800 850 900 950 1000 1100 1200 1300 1400 1500 1600 1700 1800
1.0 0.8 0.6 0.5 0.4 0.3 0.2 0.1 .08 .06 .05 .04 .03 .02 .01 .008 .006 .005 .004 .003 .002 .001 .0008 .0006 .0005 .0004 .0003 .0002 .0001 .00008 .00006 .00005 .00004 .00003 .00002 .00001
LUBRICATING OILS - VACUUM DECOMP.
RESIDUES
GAS OIL
RECYCLE STOCKS
PENTENE
HEXANE
HEPTANE & ETHYL BENZENE
OCTO-PLANE
NAPHTHAS
PENTANES
DIMETHYL PROPANE
PROPANE
BUTANES
ETHANE
METHANE

Graph showing relationship between velocity constants for the decomposition of several hydrocarbons and petroleum fractions

Example:

It may be assumed that *n*-butane decomposes according to the following reaction:

$$C_4H_{10} = C_2H_6 + CH_4$$

How much time will be required to decomposed 25 per cent of a butane feed stock at a temperature of 1,100° F. (also 1,000° F.)?

The value of K_1 for butane is 0.0098.

$$0.0098 = \frac{1}{t}\log_e\frac{100}{75}$$

$$t = \frac{0.288}{0.0098} = 29.4 \text{ seconds}$$

Or at 1,000° F.:

$$t = \frac{0.288}{0.0011} = 262 \text{ seconds}$$

Thus, if you are interested in the formation of propylene, you might expect a yield of 25 per cent by mols or gas volume in 29.4 seconds at 1,100° F. Actually, a number of decomposition reactions take place simultaneously, giving an average equation which is somewhat as follows:

$$C_4H_{10} = 0.19\,C_4H_8 + 0.3\,C_3H_6 + 0.33\,C_2H_4 + 1 \text{ mol saturated gases;}$$

or $C_4H_{10} = 0.82$ mol unsaturated gases + 1.0 mol saturated gases.

In order to plot data for many types of feed stocks on a single chart for purposes of comparison, it was necessary to use several bases. These are:

1. Hydrocarbons (methane through heptane): A mol or gas-volume basis. Also based on the disappearance of the feed-stock hydrocarbon.

2. Cracking stocks (naphtha through residuums): A liquid-volume basis, using the percentage of 400-end-point gasoline produced as the disappearance of feed stock.

3. Lubricating oils (by vacuum decomposition): A liquid-volume basis, using the percentage of lubricating oil produced as the disappearance of feed stock. Some error results because products of many different viscosities may be made.

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European Refining Practice

Abstract taken from Metals and Alloys of "A New Unit for Distillation of Crude Petroleum at Anvers-Kiel," Ossature Metallique, Vol. 9, Dec. 1938, pp. 509-511.

All flanges for manholes, pipe connections, etc., of the fractionating towers and other units are made from open-hearth steel with 0.3 to 0.5 per cent copper. This material was chosen in order to obtain the necessary thickness and thereby sufficient tightness of the joints and to allow end-to-end welding of the sheets of the columns. The condensers are likewise made from copper open-hearth steel. All these parts were arc welded. The tubes were made either from chromium-molybdenum steel or from copper-molybdenum steel, depending upon their function in the installation. Some of these parts are working under pressures up to 40 lb. and temperatures up to 300° C. (572° F.) The valve equipment is made of electric furnace steel resistant to pressures up to 50 lb. and temperatures to 400° C. (752° F.). Tubes running free are suspended in high-strength nickel-chromium cast supports; chromium-molybdenum steel is used for the tubes and junction boxes.

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A.I.M.E. ABSTRACTS

Papers Presented at Fall Meeting of American Institute of Mining and Metallurgical Engineers at Los Angeles, Calif., Oct. 19-20, 1939

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Consumption Versus Normal Demand for California Crude Oil

By ALLAN H. HAND

THE writer points out that in the event of loss of Japanese business, California crude-oil production would have to be reduced about 80,000 bbl. per day which would present a difficult problem which might force some operators to suspend production activities. It is estimated that from 1919 to 1928, inclusive, 700,000,000,000 cu. ft. of gas was blown to the air or about 30 per cent of the total quantity produced and that from 1929 to 1938, inclusive, 615,000,000,000 cu. ft. of gas was blown to the air or about 16 per cent of total production. Higher posted price for California crude oil on a product basis, in comparison with the Mid-Continent prices and with the prices prevailing for other world sources of supply, unquestionably restricts our economic markets. Likewise, the surplus production prevailing since 1929 has made it impossible for California refiners to crack fuel oil to the same extent as in the Mid-Continent so that the overall gasoline yield here is considerably less. From an economic standpoint, shipments to Europe and the Atlantic seaboard during the past 10 years have been unjustifiable as the prices obtained, with the exception of shipments of aviation gasoline, aromatic solvents, and other special products, have not returned the posted price after allowing for refining costs and transportation.

●

Effect of Faulting on Accumulation and Drainage of Oil and Gas in the Wilmington Oil Field

By READ WINTERBURN

The distribution of gravities and edgewater conditions on the various fault blocks indicate the Wilmington field of California is divided by faults into at least five separate structural traps. Accumulation apparently occurred in each of these traps independently and without movement of fluid across the faults which form the boundaries. The edgewater conditions on each block are distinctive and bear no relation to adjacent blocks. The Terminal zone contains about 60 per cent sand which is interbedded with shale members, a number of which are continuous over the whole field and result in the division of the zone into individual sand bodies. In some blocks there are pronounced fingers of edgewater and these fingers are in entirely different parts of the section. Fault planes form impervious barriers even when pervious beds are thrown against other pervious beds at the fault contact. Gravity of oil produced in the various zones often shows marked differences on opposite sides of faults. However, the gravities in each zone on the individual blocks are closely related to structural position, the highest-gravity oil being found at the highest structural locations and the lowest near the edgewater contact. However, this relationship of gravity to structural position does not hold true when wells on different blocks are compared. Apparently the segregation of gravities in conformity to structure has taken place on each block as a unit.

Study of formation pressures and variations of gas-oil ratios since the beginning of development of the field shows the faults are still effective barriers to the movement of fluid from one block to another, even though pressure differentials of 400 lb. per sq. in. across the faults have been developed at some places. Further evidence that the faults are effectively sealed is the fact that no movement of water from water sands into oil sands across the fault contacts is apparent to date, in spite of development of appreciable differential pressures. Productive capacity of wells has, in general, the same relationship to structural position as the gravity of the oil on the individual fault blocks. Productivity of wells shows marked differences on opposite sides of faults and each fault block has its own characteristics. Data on edgewater, gravity of oil, and the productivity of wells indicate that accumulation took place on each block as a separate unit with the faults acting as effective barriers to the movement of the fluid from one block to another.

In speaking of the faults in the Wilmington field as being effectively sealed, it cannot be positively asserted that there is no movement of fluid through the fault. However, the rate of any such movement to date has apparently been negligible in comparison to the rate of withdrawal from the reservoir. The possibility of such slight movements being accelerated, or even a sudden failure of the sealing effect at a fault contact if excessive pressure differentials are allowed to develop, should not be disregarded.

●

The Buried Schist Surface of the Los Angeles Basin

By EUGENE B. WAGGONER

The writer indicates (1) the buried schist surface of Los Angeles Basin is very rugged with relief between highs and lows varying from 3,500 to 10,000 ft.; (2) the development of this relief is partly the result of postburial folding and faulting which accentuated preburial schist structures; (3) the schist surface may extend for a considerable distance east of the Newport-Inglewood belt, dipping at an angle of 18° to 20°, thus explaining the great depth to the basement rock in the central part of the basin; (4) in places the schist of Los Angeles Basin contains the same minerals which are characteristic of the Franciscan complex of Central California. It is recommended that since schist highs appear to be closely connected with oil production, exploration for additional schist highs may be justified but that such exploration will have to be at least 10,000 to 12,000 ft. deep and should be guided by geophysical work.

Repressuring Operations in the Belridge Oil Field

By JAY B. WHARTON

In the early life of the North Belridge field, the utilization of that part of the gas production for which there was no market became a problem for considerable thought. As an experiment, gas was shipped to South Belridge, a distance of 7 miles, through an existing 3-in. line at input pressure of 400 lb., which is the output pressure of the gasoline absorption plant at North Belridge. The gas reached South Belridge at 325-lb. pressure and was then distributed through lateral 1-in. and 2-in. lines to key wells, being injected into the casing heads at pressures from 100 lb. to 250 lb. Gas was injected at rates varying from 500,000 to 7,000,000 cu. ft. per day. The gas appeared to spread readily over the entire field, probably following existing channels of least resistance. During the 3 years this project was in operation over 3,000,000,000 cu. ft. of gas was injected into the formation and since repressuring was discontinued in 1934 about 2,000,000,000 cu. ft. have been withdrawn. The success of this storage program resulted later in a somewhat similar program involving repressuring the Temblor zone at North Belridge. A total of 2,962,000,000 cu. ft. of gas has been injected into the Temblor at North Belridge up through the month of September 1939. It is pointed out that the primary object of this project is the storage of dry gas necessarily produced beyond market requirements, and viewed as a conservation measure it is considered successful. However, it is felt that it is too early and the data all too few to make any intelligent estimate of the benefit in the form of increased ultimate recovery due to the restoration of energy to the pool in the form of compressed gas.

●

Optimum Rate of Production of Oil

By H. T. WYATT

The study of optimum rate of oil production involves certain technical considerations which bear directly on the rate of production, spacing, and ultimate recovery for various reservoir characteristics. These findings, in the process of economic justification, must be tempered by financial considerations involving the investment-recovery periods and expected monetary returns from oil produced under various drilling and operating practices. In many instances technical and financial considerations lead to conflicting desiderata which can only be satisfied by compromise. Dependent on physical properties of the reservoir rocks and the fluids contained in their pore spaces, oil fields can be classified as producing under (1) water-drive conditions if the larger portion of the oil produced is being replaced by encroaching edgewater; (2) depletion conditions if the main driving force of the oil is supplied by the expansion of gas originally in solution in the oil and (3) the condition of an expanding gas cap if a portion of the pore space was originally filled with free gas which expands during the productive life of the field, driving the oil towards the wells. In the majority of cases all three conditions prevail and the reservoir can be classed according to the dominating condition. However, these conditions do not remain static and a change from one dominating productive force to another is often noted during the life of a field.

The distribution of reservoir pressures throughout the entire field is an important factor influencing recovery from depletion fields. The withdrawal of large quantities of oil from small areas

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in such fields, while other areas are drained slowly or not developed at all, has been found to be poor practice and best recoveries can be expected when oil withdrawals are distributed throughout in such a manner that reservoir pressures are uniformly maintained at all times. To ascertain correct withdrawal rates and attain this condition requires giving constant consideration to the volume and contents of that portion of the reservoir drained by each well. Any system of proration based chiefly on the potential oil capacity of the wells without due consideration to utilization of reservoir gas energy or regard to the deleterious effect of high withdrawals from small areas, conceivably may lead to low recoveries. With a given spacing the volumetric recovery from a reservoir can be favorably influenced through careful adjustment of the rate of production of each well. Any selection of production rates based on the potential daily oil capacity of the wells without due consideration to utilization of reservoir energy, both gas and water, and without regard to the undesirability of high withdrawals from small areas, may well lead to low recoveries. Irregular development may result in high withdrawals from small areas and consequently in reduced recovery from the entire reservoir. Under present prevailing circumstances, it is realized by all operators that curtailment is a necessary part of production practice. Consequently, we must continually compromise between the ideals and the limit to which we are held by restrictions imposed by our curtailment program. Within these limitations there are, however, certain steps which could be taken to improve the situation as regards conservation of natural resources. Exploration of untested horizons in proved fields might well be delayed to avoid the further undesirable reduction in the rate of production from existing wells. In this connection, a better understanding of mutual interests on the part of landowners and oil operators would be most beneficial, where it should be realized by both parties that the conditions discussed will react to the benefit of one as well as to the other.

●

A Method for Measuring the Amount of Entrained Gas in Drilling Fluid

By SYLVAN CROMER
Louisiana State University

The method was developed to permit results to be obtained quickly without using elaborate or fragile equipment and to eliminate the need for making any calculations. A volume of the fluid is placed in a closed cylinder having a volume V_t. This is shown to consist of a volume of noncompressible material V_m and a volume of compressible gas V_{g1}. The pressure P_1 is atmospheric. By forcing a calibrated plunger through a suitable packing gland into this cylinder the pressure is increased to P_2. The gas volume is reduced to V_{g2}. The reduction in volume is equivalent to the volume of that portion of the plunger which enters the cylinder V_p. Stated algebraically it is:

$$V_p = V_{g1} - V_{g2}$$

As no rise in temperature is noted, Boyle's law may be applied:

$$V_{g2} = \left(\frac{P_1}{P_2}\right) V_{g1}$$

Combining Equations 1 and 2:

$$V_p = V_{g1}\left(1 - \frac{P_1}{P_2}\right) \quad \text{or} \quad V_{g1} = \frac{V_p}{1 - \frac{P_1}{P_2}}$$

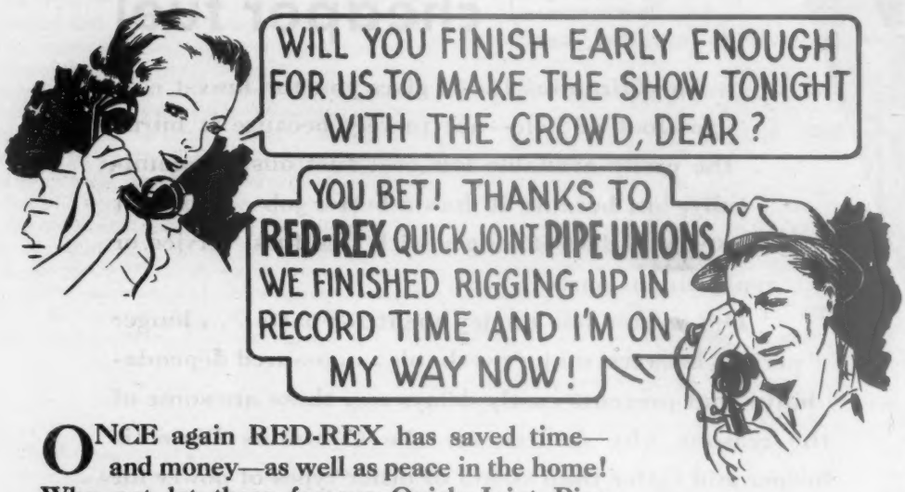
Expressing the volume of gas at atmospheric pressure as a per cent of the total volume:

$$\text{Per cent gas} = \frac{V_{g1} \times 100}{V_t} = \frac{V_p \times 100}{V_t\left(1 - \frac{P_1}{P_2}\right)}$$

As the volume of the cylinder is constant, if the pressure ratio is held constant the per cent gas will be seen to be in direct proportion to the decrease in volume V_p. As the plunger diagram is uniform throughout, a scale showing its position in the cylinder may be calibrated direct in "per cent by volume," thereby eliminating any computations.

The instrument is built with a transparent Lucite cylinder. The plunger, made of noncorrosive alloy, is moved by an internal screw. A thin rubber bulb filled with glycerin is attached to the gage to prevent its becoming filled with mud. To insure a definite volume of the sample, the cap to which the gage is attached may be removed for filling the apparatus. After the plunger has been withdrawn as far as possible, the fluid is poured directly into the cylinder until it is full, and the cap replaced with the petcock open. Any air or excess fluid is eliminated through this open petcock by holding the instrument in a vertical position and running the plunger into the cylinder until the "start" position on the scale is reached. The start position does not exactly correspond with the zero graduation on the "per cent gas" scale. The difference represents the travel of the plunger required to compensate for the increased volume of the Bourdon tube in the gage at the test pressure.

From the barometric pressure and a knowledge of the pressure ratio for which the instrument was calibrated, the test pressure is determined; thus if the pressure ratio is 3 : 1, the test pressure in gage units will be twice the barometric pressure. The instrument is filled with the fluid to be tested as has been described. The plunger is then run into the cylinder until the test pressure is indicated by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the gage and the percentage of gas is then read directly from the scale.

●

Screening Effect of Gravel on Unconsolidated Sands

By BEN GUMPERTZ

The important factors in any study of the screening of sand with a gravel envelope, as applied to use in oil wells, are (1) sand size; (2) gravel size and shape; (3) ratio of gravel size to sand size; (4) flow velocity and (5) viscosity of the oil. The first extensive investigation of the function of gravel in screening sand was performed by Coberly and Wagner from which the following conclusion was drawn: "The diameter of the largest grains in a single classified sand suitable for gravel packing is approximately 13 times the grain size at the 10-percentile analysis of the formation sample." This applies to sand classified by Tyler screens and is for gravel grains of the maximum size that could be used to form a stable bridge. Experiments conducted since the work of Coberly and Wagner have shown that the bridging effect of a given gravel with the sand-gravel interface in a horizontal plane differs from the action of the same gravel when the interface is in a vertical plane. Also, field practice has shown that the screening effect of a given gravel for a given sand apparently varies with the flow velocity. This writer concludes that the largest grains of a gravel to be used for screening unconsolidated sand over the entire range of flow velocities should bear a diameter ratio of 8 (11 upon the basis of Coberly and Wagner) to the diameter of the sand at the 10-percentile analysis. The limiting width of the walls of a gravel pack, below which the gravel will cease to act as a screen, is somewhere below 3 in. Increasing the width of the gravel pack above 3 in. does not increase its efficiency as a screen.

●

Technical Problems of Subsurface Operations in the Development and Production of Petroleum

By EARNEST K. PARKS

In order to review current problems for those who are not experienced in the technique but who are interested in contributing to progress in the drilling and production of oil wells, the author describes the general case of the discovery of an oil field and the routine development which follows. The elementary practices of drilling disclose that to reach a greater depth is and has been the greatest urge to improvement, but it is pointed out that there is still ample opportunity to reduce costs. Drilling is stated to be a metallurgical and mechanical problem, complicated by difficulties of measuring details of performance of various items. Production is concluded to be the major problem, wherein the fluid mechanics of the reservoir offer a great field for further investigation.

●

Geophysical Studies in California

By F. E. VAUGHAN

Geophysical surveys are important in throwing light upon many of the more fundamental problems of tectonic geology. Indeed, they promise to afford definite solutions of some problems heretofore held to be entirely of a speculative character. The importance of this phase of geophysical work should be stressed. It enables the geologist to gain and retain a clear picture of the structural relationships throughout a large district and to focus his attention upon definite portions. Reflection seismometry has met with unusual success in California. Some of the more important discoveries for which it is responsible are the Ten Section, Greeley, Cole's Levee, and Wilmington fields. Major companies in California, and some of the independents, recognize its value and are active in its application. Most of the more generally recognized oil territory in California has been shot over at least once. This includes the Los Angeles Basin, Oxnard Plains, Santa Maria Valley, and the San Joaquin Valley south of Hanford. Some work has also been done in various parts of the Great Valley northward nearly to Red Bluff. Reflection shooting has added to our knowledge of the general tectonic geology in several parts of the state. In this connection special attention is drawn to work done in the Los Angeles Basin under the supervision of B. Gutenberg and J. P. Buwalda, of the California Institute of Technology. Many geologists have long believed that block faulting has been important in the development of Los Angeles Basin, and the work of Messrs. Gutenberg and Buwalda bears out this conception. They adduce evidence which seems to show that there is a huge block of the basement mass dropped down between the Inglewood and Norwalk faults. The upper surface of this graben lies some 45,000 ft. below the surface of the ground. Other blocks on either side lie at depths of from 10,000 to 20,000 ft. Methods and equipment used in reflection shooting have been improved greatly during the past 4 years and some areas have been shot over as many as three times by the same company. Judging from the history of similar activity elsewhere as well as the progress here up to the present time, it seems likely that this work will continue in California for several years to come.

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GASOLINE ANTIOXIDANTS

Hard Formations Increase Cost

(Continued from Page 130)

which retard drilling as some comparatively soft formations impede progress. Some shales and gypsum beds are elastic enough to absorb much of the bit's pounding and the formation must be cut away without the aid of the shattering action of the bit. Massive limestones with few impurities are also slow drilling. The bits in such cases may be left in the hole for a considerable length of time, in some cases as much as 48 hours. When removed from the hole they are found to have suffered little damage to the cutting surfaces.

Even hard sands often speed up the drilling rate for a short time but then progress ceases altogether and the bit must be replaced with a new one. The Gilcrease sand in Oklahoma will drill rapidly for a few feet and then progress will stop. The actual drilling of 5 ft. of sand may require less than ½ hour while replacement of the bit may require from 1 to 8 hours. Soft sands may often be sharp enough to damage the bit, although a sharp bit is not required to drill this type of formation. However, a bit that has its cutting edges rounded will not penetrate the softer but tougher formations generally found under the sands.

The high costs of the bits and the danger of encountering an exceedingly hard formation must be considered when a contractor enters a new area. A contract to drill to a certain depth may be practically impossible to fulfill because of the presence of some hard formation. The same is true of drilling a well deeper in formations unknown to the contractor. Procedure recently has been for the contractor to take such work on a cost-plus basis or to lease his equipment and men to the oil operator.

During the early stages of development in a field, bit costs are often high but they are reduced as the contractor and drillers become acquainted with the formations and are thus able to obtain the maximum footage per bit. A point is finally reached, however, where the number of bits cannot be further reduced. Any difference in the number of bits used on the various wells then becomes dependent on the type of surface machinery used and the local variations in geologic conditions.

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Oil Technologists to Be Present at Michigan-Life Meeting

Refinery technologists, scientists, research men and technicians from many laboratories will gather at Ann Arbor, Mich., November 1, for the University of Michigan-Life Conference on New Technologies in Transportation, it is announced by Dean H. C. Anderson, of the college of engineering.

Speakers at the 3-day gathering will include Charles F. Kettering, vice president in charge of research, General Motors Corp.; C. R. Smith, president, American Air Lines, Inc.; Fred M. Zeder, vice chairman of the board, Chrysler Corp.; Dr. Richard M. Wick, research engineer, Bethlehem Steel Co.; Otto S. Schairer, vice president in charge of patents, Radio Corp. of America; D. A. Wallace, president, Chrysler Sales Corp.; F. G. Gurley, vice president, Atchison, Topeka & Santa Fe Railway Co.; Dr. Gustav Egloff, director of research, Universal Oil Products Co., and Dr. Merrell R. Fenske, director, petroleum refining laboratories, Pennsylvania State College.

Sponsored jointly by the University of Michigan and Life magazine, the conference is described as "designed to examine new methods, new materials, and new directions in the transportation field," dealing with aspects of engineering, metallurgy, thermodynamics, structure, tensile strength, speed and capacity in the fields of air transportation, automotive, highway, rail and marine transportation.

Conservation of Gravity Means Saving the Oil

Speaking before the East Texas chapter of the A.P.I. Production Division, W. Erwin, of the National Tank Co., outlined in very brief form the importance of conserving the lighter fractions of crude and refined products and explained how this may be accomplished. He said:

"It may be stated that the greatest gravity losses occur between the separator and the pipe-line connection, and these are usually the true losses that can be picked up by nobody once they escape the oil. It should be repeated, finally, that the use of a unitized treating system designed to carry pressure, reabsorb and recondense desired fractions, remove undesired light fractions to gasoline-plant line, treat oil to minimum b.s. and w. content, and cool oil to atmospheric temperature by heat exchanger; all this is most conducive to gravity conservation and minimization of losses to atmosphere. Equally important is the further maintenance of this gravity by providing 2 or more ounces pressure on lease stock tanks at all possible times. Aside from the standpoint of conservation of resources, every operator in the business should make himself vitally concerned with means of conserving the gravity of his oil to insure himself the maximum return on his investment and efforts."

Petroleum Institute to Hold Meeting During A.P.I.

At the November 13 to 17 meeting of the American Petroleum Institute in Chicago, the American members of the Institute of Petroleum will hold a dinner meeting. Dr. Graham Edgar, of the Ethyl Gasoline Corp., will give the address on "Tetraethyl Lead—Its Manufacture and Use." Those interested in attending, whether a member of the Institute or not, are asked to make reservation by writing W. B. Ross, Pure Oil Co., 35 East Wacker Drive, Chicago.

QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Federal Specifications Show Five Grades of Turbine Oils

What is the specification for a good oil for turbine lubrication?—S. N. L.

The federal specifications show five lubricating oils, designated "turbine, dynamo, and high-speed steam-engine lubricating oil." The five grades are indicated by the Nos. 8, 10, 20, 25, and 30, the chief difference being increasing viscosity at 130° F. from a minimum of 70 for No. 8 to a maximum of 205 for No. 30. The limits are shown in the table.

FEDERAL SPECIFICATION LIMITS FOR TURBINE OILS
(All temperatures are °F.)

Test—	8	10	20	25	30
Visc. Say. at 130°	70-90	90-120	120-145	145-185	185-205
Flash, min.	315	325	340	350	350
Carbon residue, max., per cent	0.1	0.2	0.3	0.4	0.4
Steam emul. No., max.	120	150	180	180	210

Note: Maximum pour point, common to all, is 35°. Color ranges from 4 to 6. Oxidation number Sligh maximum for each is 30. Corrosion negative.

Turbine oils shall be refined petroleum oils without admixture of fatty oils, fatty acids, resins, soaps, or other nonhydrocarbon materials and shall be suitable for the lubrication of turbines, dynamos, and high-speed steam engines.

Reference: Federal Standard Stock Catalog, Sec. IV, Part 5, VV-O-661.

Oil Products Used by U. S., Russia, Germany, and Production Data

We shall be very grateful if you will supply the following information: Normal total consumption of petroleum products, motor fuel consumed by vehicles, and population ratio for United States, Russia, and Germany. Also the crude-oil production in the same countries and Rumania too.—W. C. O.

The information presented by the U. S. Bureau of Mines and the American Petroleum Institute relating to the consumption by the various countries of petroleum products, the number of motor vehicles, population, and the production of crude oil, covers the year 1938. The data shown in the table have been arranged from these sources.

PETROLEUM PRODUCTS CONSUMED IN COUNTRIES NAMED—YEAR 1938

	Total consumption (bbl.)	Barrels per capita	Consumption rank
United States	1,134,235,000	8.72	1
Russia	164,500,000	0.99	2
Germany	53,000,000	0.67	5

MOTOR FUEL, VEHICLES AND POPULATION

	Fuel consumed (gal.)	Total motor vehicles	Population
United States	521,657,000	29,485,680	129,257,000
Russia	27,000,000	677,997	170,500,000
Germany	27,300,000	1,707,496	73,828,000

OIL PRODUCTION
(Barrels)

	Total	Rank	Per cent of total
United States	1,213,254,000	1	63.87
Russia	202,290,000	2	12.00
Germany	4,074,000	17	0.13
Rumania	48,366,000	6	2.50

The Bureau of Mines reports that the production of gasoline in Germany increased from 10,710,000 bbl. in 1937 to 11,475,000 bbl. in 1938. The increase over the past 6 years is indicated in the table.

GASOLINE PRODUCED IN GERMANY
YEARS 1933-1938

Year	(Bbl.)
1933	2,516,000
1934	3,154,000
1935	4,905,000
1936	7,463,000
1937	10,710,000
1938	11,475,000

The gasoline reported was produced from petroleum, imported and domestic, from coal and the rerunning of gasoline.

References: Petroleum Facts and Figures, 6th Edn., 1939, p. 8. U. S. Bureau of Mines, International Petroleum Trade, Vol. 8, No. 6. Oil and Kohle, Vol. 15, No. 20, Berlin, May 22, 1939, p. 413.

All Properties Must Be Known to Properly Blend Gasolines

Would appreciate it very much if you could recommend some books dealing with the blending of gasolines. I am interested in learning more facts produced by blending, as to motor performance, octane ratings and other properties related to good gasoline.—H. E.

I do not know of any publications which thoroughly cover the subject of blending of gasoline. Blending is done for a number of reasons. Probably all of the individual characteristics of a gasoline are involved. The commonest of these is gravity and the well-known rules for mixing two liquids of different gravities are applied. Volatility is to some extent associated with gravity. This is particularly true with respect to the more volatile portions but does not apply to the heavier hydrogens represented by end point. That is to say, the initial boiling point of one gasoline may be easily lowered by the addition of a lower-boiling-point product, whereas end point can be lowered very little by the addition of a lower-end-point gasoline.

Such substances as gum and sulfur may be reduced or increased by blending, depending upon the composition of the material added. Color may be diluted in a similar way. One of the very important properties of gasoline today is the octane number.

Much difficulty is encountered when an effort is made to blend different gasolines to some predetermined octane value because the substances that have a knock-inhibiting tendency do not appear to be susceptible to averaging. When an attempt is made to blend some gasolines on a basis of lead content it is found that certain gasolines have a peculiar quality known as lead susceptibility; the result may come out as desired and it may not. Such conditions are not always left to calculation. The more reliable scheme is to arrange octane values by actual engine test.

Physical and Chemical Laws and Principles Used in the Petroleum Industry

ARCHIMEDES PRINCIPLE

Floating Materials

Any floating substance always displaces its own weight of the liquid.

A body when floating in a liquid is supported by a force which is equal to the weight of the fluid displaced.

A mass having a volume of V cm.^{3} immersed in a fluid of density d grams per cm.^{3} is buoyed by a force in dynes.

$$F = dgV$$

Displacement, tons of water, is commonly applied to tankers and other boats for indicating size.

Influence of Pressure On Cracking Reaction of Oil

The exact purpose of pressure in the cracking of oils for the production of gasoline is not clear to me. Will you be good enough to give an explanation of this subject?—T. D.

Application of pressure has no relation to the speed of a chemical reaction. It appears to inhibit decomposition of petroleum oils as shown by experiments in which the oil was maintained at constant temperature while subjected to a wide range in pressure. The important influence of pressure is therefore the prevention of evaporation during the time that the oil is exposed to the selected cracking temperature.

Under mild cracking temperature, held constant for a fixed period, with pressures ranging from approximately 20 to 600 lb., no differences have been obtained in the percentage yields of light distillates. The subject of the influence of pressure during cracking conditions has been extensively treated by Sachanen and Tilicheyev, from which a few abstracts are presented.

"In liquid-phase cracking under pressure the magnitude of the pressure has no velocity of the reaction or the yield of gasoline. Cracking in the liquid phase and under pressure assures the most favorable conditions for heat transfer, avoiding local overheating and therefore giving little coke. It is therefore possible to carry out the process in an ordinary tube-still with a minimum of fuel consumption, and with the highest yields. Since increased pressure is not a necessary item in the cracking process and due to the greatest technical difficulties in constructing pressure equipment, the possibility of constructing good cracking systems for cracking at atmospheric pressure is not out of the question.

"To obtain the maximum uniformity and the greatest accuracy, pressures should be chosen such that the cracked distillate will either be absent or will be composed for the most part of gasoline and naphtha fractions.

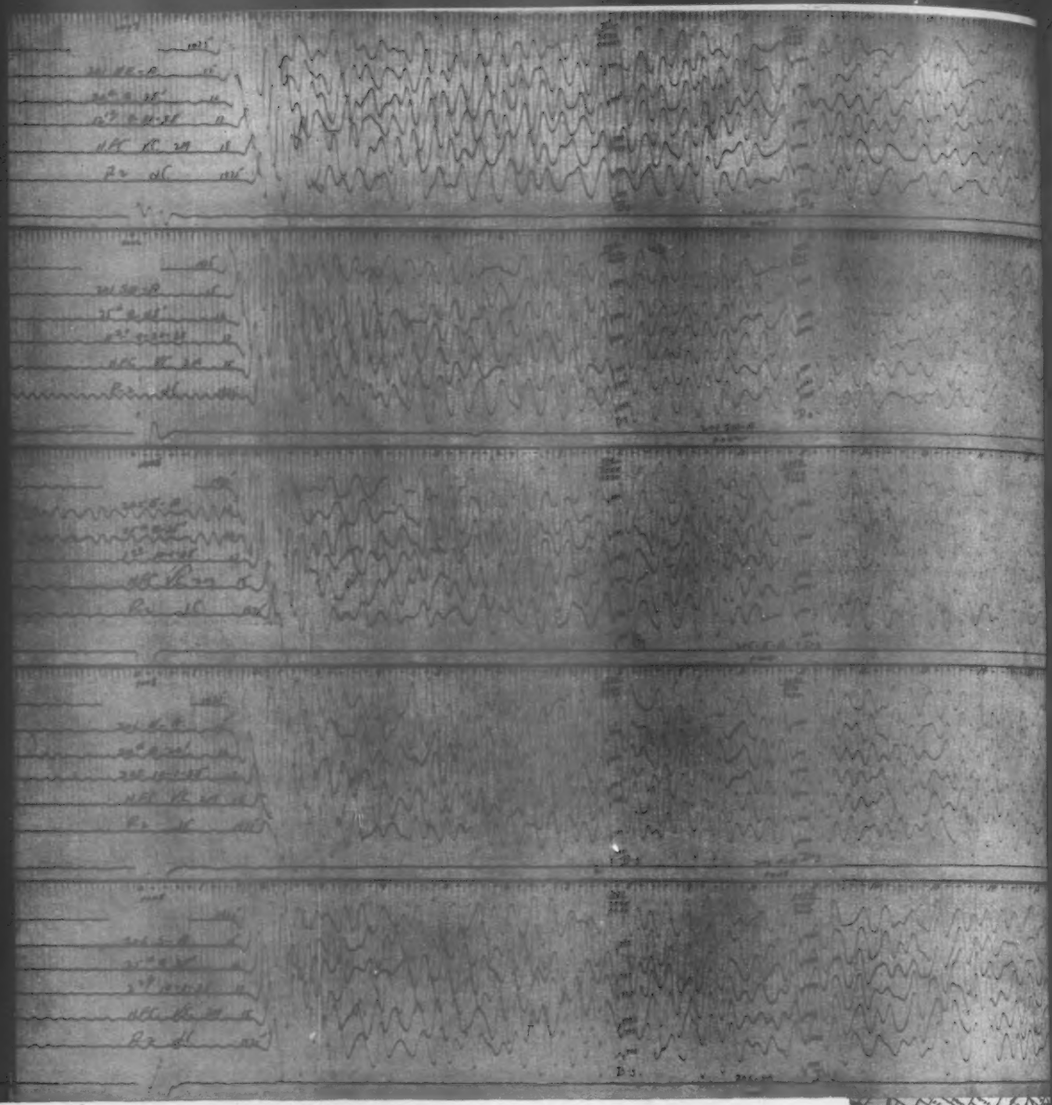
"The pressure applied may vary in accordance with the above, depending on the original product and the form of cracking. A pressure of 10 atmospheres is sufficient for mild cracking of heavy crude-oil products. Depending on the crude-oil product, the pressure might vary from 20 to 40 atmospheres when applying the second form of cracking to gas oil, distillates and heavy crude-oil products. Finally, the pressure should be about 60 atmospheres when cracking kerosene."

References: Sachanen and Tilicheyev, Chemistry and Technology of Cracking (1932). Leslie, Motor Fuels, Their Production and Technology. Leslie and Potthoff, Cracking of Petroleum Oils, Ind. Eng. Chem., 18, 776, 1926.

Records Made by

INDEPENDENT EXPLORATION COMPANY

..in Wabash River bottoms using 20 to 50 foot shot holes drilled in over 100 feet of gravel.



The records reproduced here show the character of records obtained by INDEPENDENT in a difficult area, covered with alluvial gravel. Note the shallow reflections at 0.5 seconds and excellent correlations at 0.78 seconds and 1.08 seconds.

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FIELD OPERATIONS

Summarizing the Week's Developments

OKLAHOMA—The Hunton-lime discovery well northwest of the Earlsboro pool, Pottawatomie County, flowed 1,084 bbl. of 42-gravity oil through choke on a completion test. The Altus pool, Jackson County, was extended ½ mile westward. Seventeen new wildcats were started in Oklahoma. Testing continued at a Cleveland-sand discovery well in Oklahoma County.

KANSAS—The newest producer in the Pratt County sector of the Cunningham oil and gas pool gaged 109,177,000 cu. ft. of gas to rate as the biggest gasser in the field. A Mississippi-lime pool was opened north of the Hannah area, southeastern Butler County. North and northwest extension producers in the Wherry field, Rice County, were completed.

LA-ARK-TEX—A deep test in the Lisbon, Louisiana, field was showing oil and gas in the lower Marine formation, total depth 8,507 ft. In the Tinsley dome area in Yazoo County, Mississippi, nothing definite had occurred at this writing, in the three wells drilling near the discovery well, but one of the outposts missed the pay found in the discovery well. In southern Louisiana, the Bancroft pool in Beauregard Parish had its first dry hole, abandoned at 11,018 ft. The Grand Lake field in Cameron Parish was defined on the north.

TEXAS: Gulf Coast—Seven important wildcats were started in the coastal area in Harris, Fort Bend, Brazoria and Montgomery counties. The South Cotton Lake, Martha, and West Ranch fields were extended.

Southwest Texas—The East Alice field in Jim Wells County was extended a half-mile and a new sand discovery was made in the same field. Distillate production in the Wade City field, Jim Wells County, was given a 1-mile extension southeasterly. Three outposts to the Rincon field in Starr County tested disappointingly.

West and Central Texas—New pools in Brown and Stephens counties in Central Texas led in interest. A steady program of development has been mapped out for the Cedar Lake area in Gaines County, recently opened.

North and East Texas—The Bonita pool in Montague County was extended ½ mile north in the Strawn-sand horizon. North Texas' deepest test may be abandoned at 8,258 ft., present depth. The Strawn-sand pool in Wilbarger County is assured of a ½-mile-west extension. In the eastern Texas district four wildcats were abandoned as dry in Smith, Navarro, Ellis and Nacogdoches counties.

ILLINOIS—Average daily production in Illinois has been steadily slipping in recent weeks, but it does not prevent operators from starting more work than they finish. Ninety-nine new operations were started last week, with only 82 wells completed.

MICHIGAN—A well good for 2,880 bbl. per day in the Walker field in Kent County was the best of 13 new oil wells. Thirty-four permits to drill were issued during the week which numbered nine more than the total of wells completed.

Completions in All Fields

(Week Ended October 21, 1939)

	Oil	Gas	Dry	Total	1939 total comp. to date	1938 total comp. to date
N. Y., Pa., and W. Va.	48	13	4	65	2,605	2,952
Ohio	6	7	5	18	810	792
Indiana	8	3	2	13	251	101
Kentucky	11	0	4	15	558	735
Illinois	61	0	21	82	2,895	1,386
Michigan	13	2	9	24	1,149	726
Kansas	14	1	4	19	1,047	1,316
Oklahoma	18	1	10	29	1,421	1,403
Texas:						
North Central Texas	26	1	18	45	1,899	2,560
West Texas	36	0	2	38	1,514	1,598
Texas Panhandle	3	1	1	5	331	466
East Texas	10	0	0	10	341	1,533
East Central Texas	3	0	6	9	225	289
East Texas Border	0	0	1	1	59	112
Gulf Coast Texas	22	0	2	24	1,075	1,071
Southwest Texas	30	4	17	51	1,815	1,735
Total Texas	130	6	47	183	7,259	9,364
North Louisiana	4	2	3	9	420	523
Gulf Coast Louisiana	13	0	6	19	535	394
Total Louisiana	17	2	9	28	955	917
Arkansas	1	0	0	1	207	196
Montana	3	1	1	5	132	91
Wyoming	3	2	2	7	105	129
Colorado	0	0	1	1	12	10
New Mexico	9	0	0	9	471	460
Utah	0	0	0	0	0	2
California	18	1	3	22	754	1,058
Total United States	360	39	122	521	20,631	21,638
Total previous week	330	59	118	507		
Week ended Oct. 22, 1938	383	47	93	523		

Outstanding Fields—Highlights

(Week Ended October 21, 1939)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
K.M.A.	34	40	5	3,404	1,149	32,500
Wasson-Bennett	25	75	12	13,923	468	19,725
Ector County	10	54	13	13,258	1,884	56,498
Pecos County	12	23	3	2,251	1,202	37,846
Jones County	5	9	1	1,500	573	8,500
East Texas	7	17	10	543	26,108	492,448
OKLAHOMA						
St. Louis	6	26	2	120	893	31,500
KANSAS						
Barton County	3	17	3	2,491	490	14,500
Ellis County	4	16	2	2,500	436	10,695
Rice County	4	21	3	3,022	1,376	32,385
Russell County	5	24	3	952	1,335	27,685
NEW MEXICO						
Lea County	16	51	8	5,319	2,270	102,910
Eddy County	15	59	0	0	434	11,120
LA-ARK-TEX						
Cotton Valley, La. (deep)	0	6	0	0	144	10,240
Magnolia, Ark	0	10	1	600	69	15,450
MICHIGAN						
Freeman-Redding	5	15	1	1,944	119	12,958
Kent County	10	42	8	4,825	167	10,468
CALIFORNIA						
Wilmington	5	16	6	3,053	722	87,200
ILLINOIS						
Salem	10	88	14	2,375	1,365	181,214
Louden	11	65	18	5,521	1,145	62,796
Other basin fields	30	261	29	5,593	1,756	72,956
Old fields	....	.....	....	.....	.....	8,300

West, Central and Panhandle Texas

By
D. H. STORMONT

New Pools in Stephens and Brown Areas, Central Texas

MIDLAND, Tex., Oct. 23.—Steady development throughout the entire West Texas district again featured the week's development. New locations were reported for the recently opened Cedar Lake pool in Gaines County and for the new Ordovician-producing Apco pool in northern Pecos County. Several new completions and new locations steadily push the boundaries of the great Wasson-Bennett pool farther to the north. Stanolind Oil & Gas Co., planning a steady program of development for its large holdings in the area of the new Cedar Lake pool which it opened several weeks past, staked three locations the past week making a total of four locations since the completion of the discovery well on the J. B. Rayner tract, SW cor. Section 3, Block 30-C, P.S.L. Survey, for 1,279 bbl. of oil daily. First location staked after completion of the pool opener was the company's No. 1 American Warehouse, west offset, SE cor. Section 5, Block H, D.&W. Survey. The three locations staked the past week include a 3½-mile northwest outpost on the Thomas S. Riley tract, 1,980 ft. from the east and 660 ft. from the south lines of Section 11, Block H. D.&W. Survey, 3 miles north and slightly west of the discovery well. The other two locations are offsets to the pool opener, one being No. 1 A. L. Green, south offset, and the other the No. 1 Edith Johnson estate, southwest offset. Stanolind is now moving in for the west offset on the American Warehouse tract. Activity on the No. 1 Johnson will await completion of the No. 1 American Warehouse, however, operations at the No. 1 Green are under way. Materials are also being moved in for the immediate drilling of a 3½-mile northwest outpost on the Riley tract.

Attempts to push production in the central portion of the Wasson-Bennett pool further northward were seen in the staking of three outpost locations. Farthest north test for the central part of the pool is Don Danvers' (San Antonio) No. 1 Anderson, 660 ft. from the south and west lines of Section 735. It is in the northern part of the Denver area. Danvers' No. 2 Anderson has been located 1,320 ft. east of No. 1 Anderson. Two new north extension tests for the link area between the Denver and the Bennett sections of the pool were staked by Humble Oil & Refining Co. and Oil Development Co. of Texas, respectively. The Humble location is No. 1 L. P. Bennett, 440 ft. from the south and east lines of Section 762. Oil Development Co.'s No. 3-763 fee is 440 ft. from south and 2,200 ft. from the east lines of Section 763. Both are approximately a half-mile north of the present limits of the field.

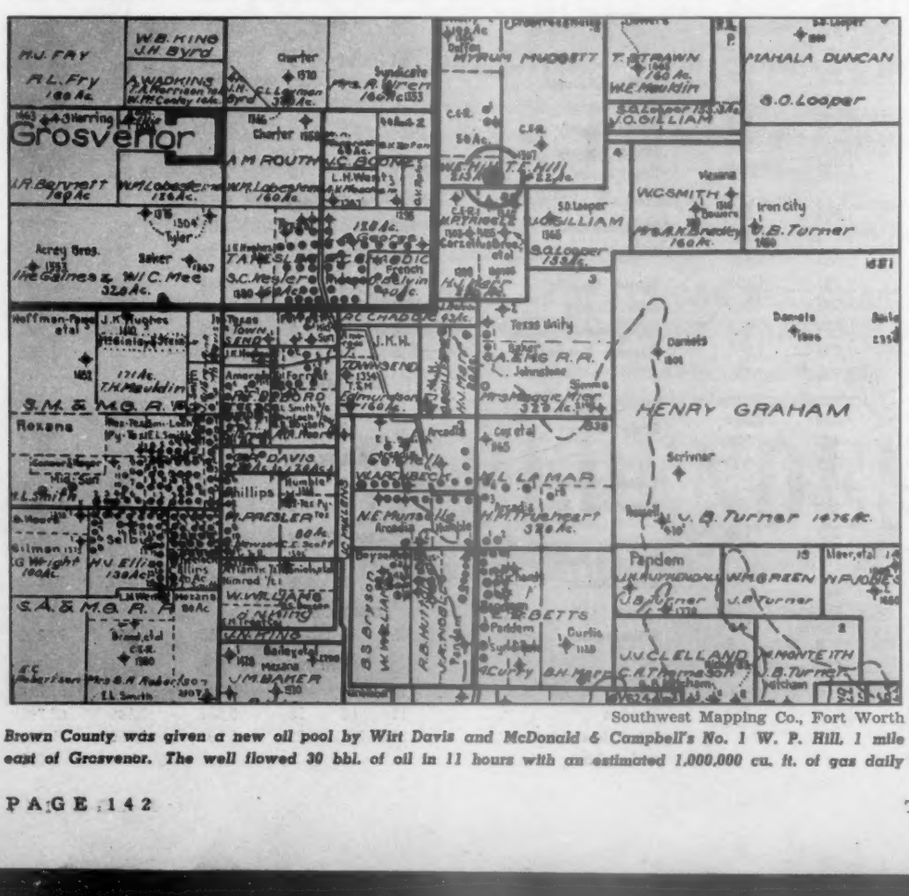
In the Seminole pool of central Gaines County and possibly defining the large structure on the north edge, Osage Drilling Co.'s No. 1 Johnson, 1-mile-north outpost to the northwest extension area, was drilling below 5,455 ft. and carrying only slight stains and an odor of oil. The test is 140 ft. below the point at which Amerada Petroleum Corp. completed its No. 1 Auten, ¼-mile extension, for 330 bbl. in 16 hours and 45 minutes. Osage's No. 1 Johnson will be drilled deeper.

South Basin Area

Due to its separation from the Sealy pool proper by several dry holes, Magnolia Petroleum Co.'s No. 2-43 Sealy, first claimed as a pool extension, is now classed as a possible new pool opener. The wildcat 1¾ miles southwest of the Magnolia-Sealy pool, was showing approximately 18,000,000 cu. ft. of gas daily as drilling was halted at 2,910 ft. to change from standard tools to rotary in an effort to better control the gas volume. First pay section was logged from 2,827 to 2,830 ft. where the test sprayed about 100 bbl. of oil daily while drilling ahead. Gas was encountered at about 2,900 ft. with increases up to the present volume in drilling ahead to 2,910 ft., total depth. The oil flow ceased after the gas was found. The company plans to deepen.

New activity was seen in northern Pecos County's Ordovician area with the staking of a new location in the Apco pool and the location for a wildcat 8 miles northwest. The wildcat is Humble Oil & Refining Co.'s No. 1 Mrs. Bertha D. Young, 660 ft. from the northwest and 1,980 ft. from the southwest lines of Section 33, Block 10, H.&G.N. Survey. It is 3 miles southwest of Magnolia Petroleum Co.'s No. 2 Abell-Eaton, a dry hole. A new test for the Apco pool is General Crude Oil Co.'s No. 1 Masterson, 660 ft. from the southeast and 1,980 ft. from the southwest lines of Section 104, Block 10, H.&G.N. Survey. It is a southeast offset to Magnolia's No. 1 J. S. Masterson which is drilling ahead toward the deep horizon.

A wildcat has been staked in the northwest part of Reeves County and 1½ miles northeast of the discovery well completed last summer as Far West Oil Co.'s No. 1 Richard Shaw, with an initial of 27 bbl. of oil daily from the Castile formation at 1,680 ft. The new test is the T. A. T. Oil Co.'s (T. B. Tripp, H. F. Anthony and J. B. Tubbs) No. 1 G. Orendorff, 330 ft. from the north and west lines of SE¼ Section 10, Block 59, P.S.L. Survey. Contract depth will be 3,300 ft. to test the Castile and the deeper Delaware sections.



Brown County was given a new oil pool by Wirt Davis and McDonald & Campbell's No. 1 W. P. Hill, 1 mile east of Grosvenor. The well flowed 30 bbl. of oil in 11 hours with an estimated 1,000,000 cu. ft. of gas daily

WEST CENTRAL TEXAS

FORT WORTH, Tex., Oct. 23.—An eventful week was passed in the West Central Texas district, the development including a new oil pool in Brown County, favorable results of last week's indicated new pool in Stephens County, continued development of Jack and Young counties' new Nelson pool, and scattered activity throughout Jones, Shackelford, Nolan and Coleman counties.

First oil discovery of major importance in several years was seen for northwestern Brown County during the week. Wirt Davis and McDonald & Campbell reported a flow of 30 bbl. of oil in 11 hours, with an estimated 1,000,000 cu. ft. of gas daily, at their No. 1 W. P. Hill, ½ mile east of Grosvenor and 3½ miles northeast of the Smith-Ellis pool. The new producer topped the Fry sand at 1,309 ft. and after drilling to 1,312 ft., total depth, started flowing over the derrick. Location is in an area which formerly produced, however, the horizon is a new discovery. Operators plan to skid rig and start another well under a quick development campaign for their 350 acres. The well is in the east part of the Hill 213 acres in the Myrum Mudgets Survey 63.

In Stephens County, T. G. Shaw was drilling in No. 1 S. P. Stroud, G. Newton Survey, which last week opened a new oil pool for the area. The well filled 2,555 ft. with oil over night from the saturated Kysinger sand drilled from 2,597 to 2,600 ft. Two additional feet of penetration was taken and the well blew in over the 65-ft. mast. Casing was cemented early in the week and as the week closed the plug had been drilled but no penetration into the horizon was made.

Continued development was seen in the recently opened Nelson pool on the Young and Jack county line, discovered by the Nelson Oil Syndicate's No. 1 Birdwell. There are several deep tests drilling toward the horizon and several in the completion stages. Liner has been run in Danciger Oil Refining Co.'s No. 7 H. E. Bailey, a shallow test deepened to the horizon, after a blowout early in the week injured several workmen at the well. A large volume of gas was found at 4,391 ft. and in drilling deeper the gas was ignited. The owners are preparing to complete the well. Location is in the A. M. Bailey Survey, Abstract 1597, 2 miles west of Bryson, and on the

(Continued on Page 178)

Texas and Louisiana Gulf

By NEIL WILLIAMS

7 Important Wildcats Start on Texas Coast; Extensions

HOUSTON, Tex., Oct. 23.—The announcement of seven important wildcat locations in the Texas sector of the Gulf Coast district and extensions and new sand discoveries in proven fields featured developments in the coastal district the past week.

Three of the wildcat locations were in Harris County, and the others in Fort Bend, Brazoria and Montgomery counties.

In Harris County, north of the town of Satsuma, Dick Schwab has derrick up for a 6,800-ft. Yegua-sand test on the W. H. Robertson lease in the Andrew Lawson Survey. Protection acreage is held by Stanolind Oil & Gas Co., Texas Co., and Sun Oil Co. In the Mount Houston area, northeast of Houston, H. C. Cockburn made location for No. 1 G. W. Burkitt in the northwest corner of the Bundick Survey. This hole will be drilled to the Frio sand which contained a good showing in Cockburn's No. 1 Griffith, a dry hole drilled several months ago. On the Oddicks prospect, Temple Hargrove is moving in material for No. 1 Herman Hospital, a 7,500-ft. Yegua-sand test located in the William Hardin Survey. Several tests drilled on this prospect logged favorable showings.

Southwest of the Mykawa field, and in Brazoria County, McDannald Oil Co. is preparing to spud No. 1 Clayton Brown, a projected 8,000-ft. Vicksburg test, located in H.T.&B. Survey No. 7. The well is approximately 2,500 ft. south of the company's No. 1 Schmeltz, a recent dry hole drilled to the Frio at a depth of 6,517 ft. Southwest of the town of Alvin, Humble Oil & Refining Co. made a location for No. 1 Hiram Moore, a 9,000-ft. test in Lot 27, Hooper and Wade Survey, Section 19. This is the third operation started in this county within recent weeks. The two other wildcats are in the Bonney area, 1 mile northeast of the newly opened Anchor field.

In Fort Bend County, north of the Juliff area, Gulf Oil Corp. is building derrick for No. 1 Russell Brown, in the William Pettus Survey, 466 ft. from the west line and midway between the north and south lines of a 280.9-acre tract. This is an exceptionally interesting well, as it will be drilled to 9,200 ft. which will carry the hole into the Vicksburg section, which showed promise of producing in Hamman Exploration's No. 1 Darrington State Prison farm. This well flowed various amounts of oil and distillate in two horizons, but due to heaving shale and mechanical trouble, the well was never successfully completed.

In Montgomery County, 2 miles southwest of Tamina Station, David MacDaniel is preparing to spud No. 1 Hattie O. Baldwin located in the Walker County School Land Survey. The area is reported to have been worked with various types of geophysical instruments. The well will be drilled to the Cockfield formation and if this horizon fails to produce the hole will be deepened to the Tertiary Wilcox sand which is expected to be found between 8,000 and 9,000 ft.

The east extension of the South Cotton Lake field, Chambers County, was extended to the south as Humble Oil & Refining Co. prepared to test No. 1-C J. H. Casey. The hole is bottomed at 6,492 ft., and 5½-in. casing was cemented at 6,486 ft. after a drill-stem test at 6,460-92 ft. recovered 1,340 ft. of pipe-line oil. In the same area Salt Dome Oil Co.'s No. 3-A Lawrence was completed through perforated liner at 6,518-21 ft., and on a 24-hour potential gage the well flowed 151 bbl. through a ⅛-in. choke.

In the same county and on the west edge of the Cedar Point field, Standard Oil Co. of Texas' No. 24 State, tract No. 118, topped gas and at 5,930 ft., oil sand at 5,943 ft. and 7-in. casing was cemented at 6,005 ft. Bottom of the hole is at 6,010 ft.

The Martha field, Liberty County, was extended to the southwest as Stanolind Oil & Gas Co. prepared to complete No. 1 Charzan. The hole is bottomed at 8,164 ft. and oil and gas sand at logged at 8,141-54 ft. A string of 5½-in. casing was cemented at 8,163 ft. The company recently made locations for seven wells, and additional rigs are being moved in for an active drilling campaign.

In the same county, on the south flank of the Esperson dome, General Crude Oil Co. completed No. 8-B Esperson for an excellent producer. Bottomed at 7,857 ft., with 5½-in. casing cemented at 7,820 ft., the well was completed through perforated casing at 7,650-7,725 ft. for an initial production of 640 bbl. per day, flowing through a ¼-in. choke.

New production was apparently added to the east flank of the old Fannett dome, Jefferson County, as Gulf Oil Corp. cemented casing for a production test in No. 12 Burrell after a 12-minute drill-stem test at 3,614-35 ft., the total depth, tested 25 lb. working pressure and 34 thribbles of oil and sand. Seven-inch casing was cemented at 3,629 ft. Oil sand was cored at 3,501-70 ft. and 3,630-35 ft.

In the south extension area of the Thompson field, Fort Bend County, John H. Blaffer extended production 1,000 ft. further south as No. 3 J. H. P. Davis is bottomed at 5,430 ft. and casing was cemented for completion.

Production from the 5,500-ft. sand in the West Ranch field, Jackson County, was being extended approximately 1 mile east as Magnolia Petroleum Co.'s No. 20-A West was showing for a producer through perforated casing at 5,545-60 ft. while the crew was cleaning out. This well was drilled to the deeper sand after it missed the 5,100-ft. pay.

Late field reports from Brazoria County show a location for a 9,200-ft. Vicksburg test in the Juliff area. The well is being drilled jointly by John Mayo and Jack Frazier and is located on the Darringston State Prison Farm, 466 ft. out of the northeast corner of a 273.2-acre tract in the A. McFarlin Survey.

Coastal Louisiana

In coastal Louisiana Humble Oil & Refining Co. was preparing to test No. 16 Gumbel which has shown evidence of opening production from a new sand on the south flank of the Darrow dome, Ascension Parish. Seven-inch casing was cemented at 8,374 ft. and a cement squeeze job has been made, preparatory to reperforating casing at 8,205-55 ft. where a recent drill-stem test recovered pipe-line oil.

The Bancroft field, Beauregard Parish, marked up its first dry hole as Republic Production Co. abandoned No. 9 Lutcher Moore after three drill-stem tests in the Tertiary Wilcox sand showed salt water. This well was drilled to a depth of 11,018 ft. in search of deeper production after the regular 7,300-ft. Cockfield sand faulted out. Location is in the southern part of the field in Section 15-16s-13w.

Another failure was marked up for the Wilcox trend as Pan American Production Co. abandoned No. 1 Anderson-Post Hardwood Lumber Co. at a total depth of 6,508 ft. The well is located about 15 miles west of Leesville in Section 27-2n-11w.

Pan American Production Co.'s No. 1 Mills, La Place prospect, St. John the Baptist Parish, continues to look good as additional showings are logged. After indicating a distillate producer the previous week on a drill-stem test at 8,870-96 ft., the hole was cored ahead below 9,445 ft., with sands showing oil and gas logged at 8,898-8,911 ft. and 8,922-28 ft.

The Grand Lake field, Cameron Parish, was defined to the north as Superior Oil Co. abandoned No. 3 State at a total depth of 9,796 ft. The rig is being moved south of production for No. 4 State in Section 24-13s-4w.

In the West Gueydan field, Vermilion Parish, Magnolia Petroleum Co.'s No. 2 Adam Cormier was completed for an initial production of 51 bbl. of distillate per day, flowing through a 12/64-in. choke. The well is located west of the company's No. 3 Ferguson and produced through casing at 7,140-50 ft.

Southeast of Abbeville, Vermilion Parish, location for a deep wildcat, Texas Co.'s No. 1 Vermilion Parish School Board, in Section 16-13s-4e. Another interesting wildcat location was made in Terrebonne Parish by Barnsdall Oil Co. for No. 1 Nelson in Section 2-21s-11e. On the Coon Point prospect, offshore from Terrebonne Parish in Caillou Bay, Texas Co.'s No. 3 State-Coon Point topped salt at 8,475 ft. and was abandoned after drilling the formation to 8,488 ft.

TEXAS GULF COAST COMPLETIONS IN PROVEN FIELDS

Brazoria County

Hastings field: Stanolind Oil & Gas Co.'s No. 10 Surface, perforated casing 6,067-78 ft., 385 bbl., 16 hours, ¼-in. choke. West Columbia field: Hogg Oil Co.'s No. 4 Hogg-Hamman, sand 2,658-84 ft., 141 bbl., ¼-in. choke.

Chambers County

Anahuac field: Humble Oil & Refining Co.'s No. 9 Shaver, sand 7,109-22 ft., 110 bbl., ¼-in. choke. South Cotton Lake field: Salt Dome Oil Corp.'s No. 3-A Lawrence, perforated casing 6,518-21 ft., 151 bbl., ⅛-in. choke.

Fort Bend County

Thompson field: John Blaffer's No. 2 Davis, sand 5,390-5,407 ft., 469 bbl., ¼-in. choke.

Hardin County

Saratoga field: H. L. Lewis' No. 1 Gulf Oil Corp., sand 775-99 ft., 14 bbl., pumping. Sour Lake field: Paul Fruge's No. 1 Jackson, sand 1,920-51 ft., 150 bbl., pumping.

Harris County

Clear Lake field: Humble Oil & Refining Co.'s No. No. 11-C Humble-West, sand 5,847 ft., 120 bbl., ⅛-in. choke. Humble Oil & Refining Co.'s No. 20-C Humble-West, sand 5,880-5,904 ft., 130 bbl., ⅛-in. choke. Friendswood field: Humble Oil & Refining Co.'s No. 4 Owens, sand 6,016-34 ft., 505 bbl., ¼-in. choke. Humble Oil & Refining Co.'s No. 4-B Godwin, 6,044 ft., 400 bbl., ¼-in. choke. Fairbanks field: Margay Oil Corp.'s No. 4 White, sand 6,888-6,902 ft., 153 bbl., ⅛-in. choke. Humble field: John Deering's No. 1 Burt, sand 2,717-2,800 ft., 32 bbl., pumping. Tomball field: Shell Oil Co., Inc.'s No. 3 Tyson, sand 5,559-71 ft., 532 bbl., ¼-in. choke.

Jackson County

West Ranch field: Humble Oil & Refining Co.'s No. 23-A West Ranch, sand 5,552-62 ft., 453 bbl., ¼-in. choke. Humble Oil & Refining Co.'s No. 4 Toney, 5,598 ft., 450 bbl., ¼-in. choke.

Jefferson County

Lovells Lake field: Humble Oil & Refining Co.'s No. 7 Broussard, 6,900 ft., dry and abandoned. Humble Oil & Refining Co.'s No. 6 Jefferson Land Co., 7,793 ft., 168 bbl., ⅛-in. choke.

Liberty County

Hardin field: L. W. Wickes' No. 5 Tullos, sand 7,581 7,620 ft., 410 bbl., ¼-in. choke. Esperson field: Sun Oil Co.'s No. 8-B Esperson, perforated casing 7,650-7,725 ft., 640 bbl., ¼-in. choke.

Montgomery County

Conroe field: A. A. Cameron's No. 1 Ksensky, 5,135 ft., dry and abandoned.

(Continued on Page 168)

Illinois, Indiana and Kentucky

By STAFF CORRESPONDENT

Completions Fall Behind New Work in Illinois Basin District

MATTOON, Ill., Oct. 23.—Production of the Illinois fields continued its recent slump having averaged 325,266 bbl. per day in the past week as against 330,100 bbl. in the previous week and 332,715 the week before that. There is no let-up in operations, as 82 wells were completed last week and 99 new operations were started in 14 counties, including Fayette, 17; Marion, 39; Edgar, 4; Richland, 3; Lawrence, 2; Clay, 3; Wabash, 14; Edwards, 1; White, 3; Gallatin, 1; Monroe, 1; Washington, 4; Franklin, 1, and Wayne, 6.

The completions included 61 oil wells and 21 dry holes. In Fayette County 20 new wells registered 5,580 bbl. initial production. In Wabash County 15 wells had 2,578 bbl. initially, and Marion County 17 wells with an initial production of 3,733 bbl., which was kept down by the fact that the Texas Co.'s completions are gaged only 3 hours on their first day. The completions and initial production in other counties included Richland, 2 wells, 722 bbl.; Hamilton, 1 well, 400 bbl.; Jefferson, 3 wells, 341 bbl.; Washington, 3 wells, 135 bbl. The dry holes completed were 1 each in McDonough, Fayette, Clark, Richland, Lawrence, Bond and Hamilton; 2 each in Perry, Washington, Edwards, Marion; 3 in Effingham and 3 in White.

It is said that nearly every well in the Sandoval field in Marion County, producing from the Devonian lime, is making from 7 to 15 per cent crude oil and from 93 to 85 per cent salt water. Max Pray has started a salt-water disposal well on his Robinson lease. He will drill to a formation about 800 ft. in depth.

Shell Oil Co., Inc., opened a pool between the Sandoval and Patoka pools with No. 1 F. Lutz, NW NW SE Section 18-3n-1e, in Benoist sand at 1,430-44 ft. It is Shell's first pool opener in the state. The well swabbed 100 bbl. in 10 hours.

Completed Wells

Following is the completion record of the week, the initial production representing 24 hours unless otherwise given:

In McDonough County Fowler, Hunter & Cruse's No. 1 Stoneking, C SE SW Section 34-4n-3w of fourth principal meridian, Niagara lime at 657-92 ft., dry and abandoned at 700 ft.

In Clark County Patmin Production Co.'s No. 1 Ingersol, NW SW SE Section 29-11n-14w, of second principal meridian, total depth 1,117 ft., plugged back to 1,058 ft. and shot with 80 qt. on bottom, dry and abandoned.

In Fayette County, Louden field, Carter Oil Co.'s No. 2 Fichtman, SE SW SE Section 22-8n-3e, total depth 1,514 ft., shot with 10, 20 and 10 qt., flowed 450 bbl. per day and 250,000 cu. ft. of gas. Carter's No. 2 M. Rhodes, NW NE NE Section 27-8n-3e, total depth 1,561 ft., shot with 20, 30 and 30 qt., flowed 666 bbl. per day. Carter's No. 3 W. Durbin, NE SE SE Section 28-8n-3e, total depth 1,595 ft., plugged back to 1,528 ft., shot with 40 qt., flowed 390 bbl.; Cypress sand at 1,471-1,524 ft. Carter's No. 5 R. Dunaway, C W½ NE NE Section 29-8n-3e, Cypress sand at 1,376-1,401 ft., shot with 60 qt., swabbed 288 bbl. through casing. Carter's No. 5 B. Kimbrell, C N½ SE NW Section 29-8n-3e, Cypress sand at 1,429-68 ft., shot with 40 qt., swabbed 128 bbl. through casing. Jarvis Brothers' No. 12 Sinclair, 330 ft. from south and 532 ft. from west lines of NW NE Section 29-8n-3e, Cypress sand at 1,393 ft., total depth 1,416 ft., shot with 30 qt., pumped 75 bbl. Jarvis' No. 15 Sinclair, C N½ NE NW Section 29-8n-3e, shot with 30 qt. at 1,511-28 ft., pumped 130 bbl. Magnolia Petroleum Co.'s No. 6 Buzzard Brothers, shot with 40 qt. at 1,391-1,402 ft., flowed 230 bbl. Carter Oil Co.'s No. 3 H. Tucker, NW NE SE Section 32-8n-3e, shot with 40 qt. at 1,565-78 ft., and ripped casing at 1,515-40 ft., flowed 720 bbl. of oil and 100,000 cu. ft. of gas. Carter's No. 6 Arthur Watson, SW SE SW Section 33-8n-3e, total depth 1,586 ft., plugged back to 1,572 ft. and shot with 20 and 20 qt., Cypress sand at 1,463-1,527 ft. and Paint Creek (stray) sand at 1,540-63 ft., swabbed 292 bbl. through casing. Carter's No. 7 Tom Wright, C S½ SW SE Section 20-8n-3e, total depth 1,434 ft., Cypress sand at 1,379-1,425 ft., shot with 80 qt., swabbed 508 bbl. through casing. Carter's No. 3 Cline, C SE NE SE Section 14-8n-3e, Cypress sand at 1,459-87 ft., shot with 30 qt., swabbed 180 bbl. Shell Oil Co., Inc.'s No. 4 R. Jedamski, SW NE SW Section 21-7n-3e, Cypress sand at 1,556-83 ft., shot with 21 qt., pumped 42 bbl. in 8 hours. Carter Oil Co.'s No. 6 H. Welker, NE SW SE Section 7-7n-3e, Cypress sand at 1,484-1,522 ft., Paint Creek sand at 1,567-77 ft., shot with 15 qt. at 1,487-93 ft., swabbed 184 bbl. through

(Continued on Next Page)

Gibson County Completions Include a 1,500-Bbl. Well

EVANSVILLE, Ind., Oct. 23.—Eight oil wells, three gas wells and two dry holes were completed in Indiana in the past week in review. Some of the oil wells were gaged only a short time. Continental Oil Co. completed a well that flowed 270 bbl. naturally in 4 hours and Lewis Production acidized a new well that made 329 bbl. in 18 hours. Both wells were in Gibson County.

Following is the record of the week:

Gibson County

In Gibson County Lewis Production Co.'s No. 3 Cooper D, NE NE NW Section 13-3s-14w, Ste. Genevieve lime top at 2,780 ft., pay at 2,864-75 ft., acidized with 2,000 gal., flowed 329 bbl. in 18 hours. Continental Oil Co.'s No. 5 Bozeman, NW NW NW Section 24-3s-14w, pay at 2,481-2,517 ft., flowed 270 bbl. naturally in 4 hours. J. E. Amis, Jr.'s No. 5 Cooper, NW cor. SW NE NE Section 24-3s-14w, pay at 2,500-17 ft., pumped 126 bbl. in 24 hours. Papoose Oil Co.'s No. 1 Cooper B, NE SE SW Section 12-3s-14w, shot with 10 qt. at 2,495-2,500 ft., pumped 100 bbl. in 24 hours. Continental Oil Co.'s No. 5 Cooper, SW SW SE Section 12-3s-14w, total depth 2,877 ft. where water had broken in, plugged back to 2,155 ft. and casing perforated at 2,130-40 ft., pumped 83 bbl. of oil and 68 bbl. of water in 24 hours.

Lewis Production Co.'s No. 3 Cooper C, NW SE NW Section 24-3s-14w, in oil sand at 2,516-26 ft., was swabbing 90 per cent water, believed to be coming from break in the casing.

Hollandsworth & Bander were drilling at 1,828 ft. in No. 23 Cooper, NE cor. SE NW NE Section 24-3s-14w. Huddleston and others had rig up for No. 2 Jolly, SW cor. SE SE NW Section 18-3s-13w. Midwest's No. 1 Bryant, SW NW NE Section 15-2s-9w, drilling at 1,000 ft. Lane & Gray and others' No. 1 McCarthy, NW SE NW Section 13-2s-11w, total depth 2,200 ft., plugged back to 1,821 ft. and shut down for orders. Midwest's No. 3 Erdell, SE cor. SW SW Section 23-2s-9w, total depth 1,478 ft., rigging up to pump. Hullman and others' No. 1 Hollis, SW cor. SE SW NW Section 36-2s-11w, rigging up standard tools. Newton Pipe Line Co.'s No. 2 Carruthers, NW cor. NE SE SE Section 26-1s-10w, drilling at 245 ft. Shirley and others' No. 1 McRoberts, NE cor. SE NW NE Section 7-1s-9w, drilling at 350 ft.

In Pike County A. J. Walker and others' No. 1 Colvin, C N½ NW NE Section 30-1n-6w, moving in for cable-tool test. Murphy Oil Co.'s No. 8 Stewart, C NW NW Section 26-1n-9w, shot with 60 qt. at 942-68 ft., pumped 3 bbl. per hour, estimated a 33-bbl. well.

Posey County

In Posey County H. G. Lewis and others' No. 1 Hill, NE NW SE Section 35-3s-4w, total depth 3,115 ft., was acidized with 1,000 gal. and increased its production from 15 bbl. per day to 75 bbl. per day, but with 5 bbl. of water. It was shut in for lack of pipe line.

Roberts Brothers' No. 1 Keck, NW NE NW Section 34-3s-14w, sand at 2,781-99 ft., pumped 170 bbl. of oil in 11 hours but was not yet a completion. C. W. McKeehan and others' No. 1 Keck, NW NW NW Section 35-3s-14w, total depth 2,503 ft., flowed 400 bbl. of oil in 10 hours and was shut in awaiting erection of storage. Sun Oil Co. completed No. 4 Heil, SE SE SE Section 1-7s-12w. It was shot with 40 qt. at 1,753-75 ft., total depth 1,893 ft., and pumped 50 bbl. the first day.

Haynes & Thomas No. 3 Seifert, SW cor. NW NW SE Section 19-6s-12w, had a showing of oil at 351 ft. and 2,500,000 cu. ft. of gas at 370-76 ft.

Superior Oil Co. made a location for No. 12 New Harmony, NW SW SW Section 10-5s-14w. Roberts Brothers were rigging up rotary for No. 2 Keck, NE NW NW Section 34-3s-14w. J. E. Crosbie, Inc., had rig up for No. 1 Keck, NE SW NE Section 34-3s-14w. Sun Oil Co. made a location for No. 1 Grabe, NW NE SW Section 1-7s-12w.

Spencer County

In Spencer County Damron Brothers' No. 2 Wright, C SE SE Section 19-7s-6w, set 6-in. casing at 883 ft., total depth, but cement job did not hold. W. C. Pollick and others' No. 1 Hagen, C S½ NW NW Section 19-7s-6w, underreamed 8-in. casing to 927 ft. Damron Brothers' No. 1 Howard, SW SE SE Section 35-7s-7w, ran 6-in. casing to 1,530 ft., but pipe collapsed. Kelly and others' No. 1 Niles, SE SW SE Section 35-7s-7w, total depth 1,555 ft., trying to drill by junk in the hole. Kelly and others' No. 1 Eberhardt, NW NW SW Section 9-6s-4w, shut down at 600 ft. J. S. Albertson's No. 1 Ray, SW NE SE Section 11-6s-4w, shut down at 630 ft. Charles E. Dice's No. 2 Gross, SW cor. SE NE NE Section 11-6s-4w, location. B. K. Maitland's No. 1 Gross, SW NW NE Section 11-6s-4w, location. R. E. Cope and others' (formerly reported D. P. Hyne) No. 1 Varney, NE NE SW Section 24-6s-5w, acidized with 1,000 and 2,000 gal. at 1,002-10 ft., estimated production 36 bbl. of oil and 12 bbl. of water; not completed. Major Oil Co.'s No. 1 Haynes, SE SE NE Section 11-6s-7w, shut down at 1,145 ft. Sunshine Oil Co.'s No. 1 Trent, NE cor. SW SE Section 11-5s-6w, Ste. Genevieve lime top at 1,161 ft., drilling at 1,205 ft.

Knox County

In Knox County A. C. Thomas' No. 1 Schwab, Lot 44, Township 2n-10w, small showing of oil at 1,874-78 ft., set 5¾-in. casing at 1,820 ft.; no test. Newton Pipe Line Co.'s No. 1 Like, Donation 171, Township 2n-9w, drilling at 1,130 ft. M. I. T. Syndicate's No. 1 McHenry,

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casing. Jarvis Brothers' No. 1 Yakey, N½ NW SE Section 6-7n-3e, Cypress sand at 1,455-85 ft., shot with 40 qt., pumped 110 bbl. Jarvis' No. 10 Yakey, SE cor. NW SE Section 6-7n-3e, shot in Cypress sand at 1,453-71 ft., flowed 224 bbl. Carter Oil Co.'s No. 9 N. M. Hopper, C W½ E½ SE Section 6-7n-3e, Cypress sand at 1,458-89 ft., shot with 70 qt., flowed 312 bbl. of oil and 100,000 cu. ft. of gas. Carter's No. 8 E. Hopper, SW SW SW Section 5-7n-3e, Cypress sand at 1,460-97 ft. and Bethel sand at 1,556-73 ft., shot with 10 and 20 qt., swabbed 504 bbl. Carter's No. 4 Clow 65-C, SW SW NW Section 5-7n-3e, Cypress sand at 1,445-92 ft., shot with 15 qt., swabbed and flowed 312 bbl. of oil and 100,000 cu. ft. of gas.

In the St. James pool, Texas Co.'s No. 1 Chrisman, NW NE NW Section 7-6n-3e, Cypress sand at 1,561-82 ft., pumped 24 bbl. in 3 hours; rated at 168 bbl. per day. Texas' No. 1 Neathery, NE NE NW Section 6-6n-3e, Cypress sand at 1,540-65 ft., pumped 35 bbl. in 3 hours, rated at 245 bbl. per day.

Charles Lowry's No. 1 Breeze, SE SW NE Section 1-7n-2e, dry and abandoned at 1,670 ft. Bethel sand was topped at 1,635 ft.

In Effingham County Frank Searight's No. 1 Wilson, NE NW SE Section 31-6n-5e, McClosky lime at 2,486-94 ft., total depth 2,539 ft., dry and abandoned. N. M. Downley and others' No. 1 Alwerdt, NW NW SE Section 8-6n-5e, dry and abandoned at 2,500 ft. Phillips Petroleum Co.'s No. 1 Overbeck, NW cor. SE SE NW Section 31-8n-7e, dry and abandoned at 2,853 ft. (corrected depth). Fredonia lime was topped at 2,533 ft.

In Richland County Pure Oil Co.'s No. 1 E. M. Krapp, SE NE NW SW Section 31-5n-10e, Roseclaire pay at 2,827-42 ft., flowed 705 bbl. per day through 1-in. choke on casing and tubing. Pure's No. 1 Hunley, SE SE SE Section 22-4n-9e, Cypress sand at 2,597-2,605 ft., pumped 17 bbl. of oil and 5 bbl. of water. Woolf Brothers' No. 1 Hinderliter, NE NE NW Section 9-1n-13w of second principal meridian, abandoned at 2,765 ft., McClosky lime topped at 2,708-52 ft. contained water.

In Wayne County Dunlap's No. 2 Mary Felix, SW SW NE Section 34-2s-8e, pays at 3,391-92 ft. and 3,404-09 ft., acidized with 4,000 gal., flowed 325 bbl. in 14 hours and then died. Illinois Mid-Continent Oil Co.'s No. 1 Vaughn, SW SW NE Section 35-2s-8e, Ste. Genevieve lime pay at 3,351-55 ft., acidized with 5,000 gal., flowed 210 bbl.

In Lawrence County Ann Bell Oil Co.'s No. 1 Wright, NE NW SE Section 21-2n-13w, of second principal meridian, dry and abandoned at 2,770 ft., Aux Vases sand was topped at 2,635 ft.

Keensburg's 15 Completions

In Wabash County Centralia Refining Co.'s No. 1 Beard, SE SE SW Section 9-2s-13w, in the Keensburg townsite pool, Cypress sand at 2,443-57 ft., pumped 93 bbl. Centralia's No. 1 Berringer, SE SE SW Section 9-2s-13w, Cypress at 2,447-57 ft., shot with 5 qt. on bottom, pumped 87 bbl. Centralia's No. 1 Butts, NE SE SW Section 9-2s-13w, Cypress at 2,437-56 ft., shot with 5 qt. on bottom, pumped 89 bbl. Sidney Davis & Co.'s No. 1 Stevens, NE SE SE SW Section 9-2s-13w, Cypress at 2,441-59 ft., shot with 10 qt., pumped 156 bbl. J. J. Deaner's No. 4 Williams, NW SE SW Section 9-2s-13w, Cypress at 2,430-50 ft., shot with 40 qt., pumped 600 bbl. D. & H. Drilling Co.'s No. 2 Bump heirs, NE SW SW Section 9-2s-13w, Cypress at 2,445-52 ft., shot with 10 qt., pumped 80 bbl. D. & H. Drilling Co.'s No. 4 Bump, SE cor. NW SW SW Section 9-2s-13w, Cypress sand at 2,427-46 ft., shot with 20 qt., swabbed 380 bbl. H. Fotiades' No. 1 Hawkins and others, NE SW SW Section 9-2s-13w, Cypress at 2,455-70 ft., shot with 15 qt., pumped 5 bbl. Hollandsworth's No. 1 Riggs, Cypress at 2,445-60 ft., pumped 111 bbl. Kingwood Oil Co.'s No. 1 Bump, NW SE NW Section 9-2s-13w, total depth 2,856 ft., plugged back to 2,420 ft. and shot with 10 qt. in Cypress sand at 2,415-25 ft., pumped 310 bbl. Oliver Petroleum Co.'s No. 1 Lovelette, NW cor. SW SE SW Section 9-2s-13w, Cypress sand at 2,458-65 ft., pumped 54 bbl. T. T. Ward's No. 1 Howell heirs, SW SE SW Section 9-2s-13w, Cypress sand at 2,444-61 ft., pumped 82 bbl. Yount's No. 1 Grace, SE NE SW Section 9-2s-13w, Cypress at 2,427-43 ft., shot with 10 qt., pumped 175 bbl. F. M. Blair's No. 1 Mann, SW cor. NE SE SW Section 9-2s-13w, Cypress sand at 2,434-47 ft., shot with 20 qt., pumped 146 bbl. W. A. Bailey's No. 1 Perrin, NE SE SW Section 9-2s-13w, Cypress at 2,436-58 ft., shot with 15 qt., pumped 210 bbl.

In Bond County Jarvis Brothers' No. 1 Zebb, NE NW SE Section 21-5n-3w, was dry and abandoned at 2,456 ft. Devonian lime was topped at 2,317 ft.

Marion County

In Marion County, Tonti pool, Mrs. King's No. 4 Kagy, SW cor. SE¼ Section 33-3n-2e, McClosky lime at 2,137-49 ft., swabbed and flowed 40 bbl. per hour.

In the Salem pool, Texas Co.'s No. 6 McCoy, NW NE NW Section 33-2n-2e, McClosky lime at 2,001-13 ft. and 2,036-46 ft., acidized with 2,000 gal., flowed 231 bbl. Ohio Oil Co.'s No. 25 C. E. Lloyd, SW SW SE Section 28-2n-2e, McClosky lime at 1,966-72 ft. and 2,017-23 ft., acidized with 3,000 gal. pumped 24 bbl. Rockhill's No. 3 Hanley, SW NE NE Section 28-2n-2e, Benoist sand at 1,858-70 ft., shot with 15 qt., pumped 155 bbl. of oil and 5 bbl. of water. Ohio Oil Co.'s No. 11 M. J. Young, SW NE NW Section 29-2n-2e, McClosky lime at 1,961-68 ft., and 1,995-2,002 ft., acidized with 3,000 gal., flowed 250 bbl. Texas Co.'s No. 13 Connell, NE SW SE Section 31-2n-2e, McClosky lime at 1,856 ft., total depth 1,916 ft., flowed 70 bbl. in 3 hours rated at 490 bbl. a day. Texas Co.'s No. 38 City of Centralia land, C W½ SE SW Section 33-2n-2e, McClosky pay at 2,038-64 ft., flowed 39 bbl. in 3 hours, rated at 273 bbl. a day. Texas Co.'s No. 6 Shanafelt, NW SE NW Section 16-2n-2e, Benoist sand at 1,843-53 ft., shot with 10 qt., swabbed and flowed 23 bbl. in 3 hours, rated at 161 bbl. a day. Ohio Oil Co.'s No. 22 M. Young heirs, SW SE SW Section 20-2n-2e, McClosky pay at 1,961-69 ft., acidized with 2,000 gal. flowed 456 bbl. Shell Oil Co.'s No. 5-B Young heirs, NW SE SE Section 20-2n-2e, Aux Vases pay at 1,792-1,805 ft. and 1,815-50 ft., shot with 25 qt. at 1,834-52 ft., flowed 375 bbl. Texas Co.'s No. 7 Johnson, SW NE NE Section 16-2n-2e, McClosky lime at 2,089-2,110 ft., flowed 48 bbl. naturally in 3 hours, rated at 336 bbl. a day. May Pray's No. 5 Cole, NE cor. SE NW SE Section 16-2n-2e, old well deepened from 2,091 ft. to 2,525 ft. and then plugged back to 2,100 ft., pumped 35 bbl.

Ohio Oil Co.'s No. 13 Murray, NE NE SW Section 7-1n-2e, Salem Pool, Aux Vases pay at 1,813-35 ft., shot

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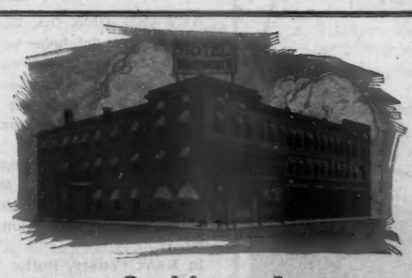

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THE POSITIVE LEAK PREVENTER

with 40 qt. at 1,847-68 ft., pumped 200 bbl. Texas Co.'s No. 7 Richardson, SE NE SW Section 4-1n-2e, Benoist sand at 1,836-65 ft., pumped 175 bbl. Texas Co.'s No. 8 H. Heydrick, NE SE SW Section 4-1n-2e, Benoist at 1,845-74 ft., pumped 30 bbl. in 3 hours, rated at 210 bbl.

In the Centralia area W. H. Wright and others' No. 1 Bryant, C S½ NE NE Section 4-1n-1e, was dry and abandoned at 1,860 ft.

In the Sandoval area Big Four Oil Co.'s No. 2 Chaffin, N½ NW NE NW Section 9-2n-1e, Devonian lime pay at 2,984-88 ft., flowed 960 bbl. of fluid per day, 60 per cent water. Menhall and others' No. 1 Goodwin, NE cor. NW SE Section 8-2n-1e, Devonian pay at 2,984-93 ft., acidized with 100 gal., pumped 198 bbl. of oil and 1,600 bbl. of water. Florence Oil Corp.'s No. 1 Suggs-Meeker, SW cor. NW NW NW Section 11-2n-1e, dry and abandoned at 2,092 ft. St. Louis lime topped at 2,088 ft.

In Edwards County Howell & Metzger's No. 1 Grant Broster, NW SE SE Section 34-2s-14w, was dry and abandoned at 2,658 ft., Cypress sand topped at 2,598 ft. had no showing of oil. Howell & Politis' No. 1 Broster, SW SE NE Section 34-2s-14w, was dry and abandoned at 3,032 ft., Barlow sand at 2,639 ft. and shaley sand at 2,685-2,705 ft. had no showing of oil.

In White County Pace & German's No. 1 Hon, SW cor. Section 33-3s-14w, of second principal meridian, dry and abandoned at 3,100 ft., Aux Vases sand was topped at 2,800 ft. and there was a sand at 2,907-35 ft. Ben Nation's No. 1 Garrett, SE SE SW Section 12-4s-8e, Fredonia lime at 3,462 ft., total depth 3,554 ft., dry and abandoned. Ivan White and others' No. 1 Ford and others, C W½ NW SE Section 34-4s-14w, dry and abandoned at 2,990 ft. Cypress sand was topped at 2,576 ft.

In Hamilton County Kingwood Oil Co.'s No. 1 Schmuck, SE NE NE Section 2-4s-6e, dry and abandoned at 3,550 ft., perforated at 3,416-26 ft., tested water. Penn Illinois Oil Co.'s No. 1 Porter, C E½ SE NE Section 12-6s-8e, Roseclaire lime at 3,028 ft., pay at 3,067-73 ft., flowed 400 bbl. of oil naturally, casing pressure 410 lb.

In Jefferson County Magnolia Petroleum Co.'s No. 1 Stonecipher, NW SE NE Section 9-1s-1e, Benoist sand at 2,067-79 ft., shot with 10 qt., pumped 111 bbl. Carter Oil Co.'s No. 1 J. Cameron, SE NE NE Section 16-1s-2e, Bethel sand shot with 15 qt. at 1,944-47 ft., pumped 54 bbl. Carter's No. 4 A. Boggs, NW NW SE Section 4-1s-2e, Bethel sand at 1,956-59 ft., shot with 15 qt., pumped 176 bbl.

In Washington County Ohio Oil Co.'s No. 2 Bielatowicz, SE SE NE Section 22-3s-3w, Benoist sand at 1,265-75 ft., shot with 13 qt., pumped 76 bbl. Ohio Oil Co.'s No. 3 Bielatowicz, NE SE NE Section 22-3s-3w, shot with 13 qt. at 1,264-70 ft. and 1,298-1,302 ft., pumped 46 bbl. Lilly and others' No. 2 Pinski, SW NE SW Section 23-3s-3w, shot with 10 qt. at 1,272-76 ft., pumped 13 bbl. of oil and 13 bbl. of water. C. E. Woolbridge, NW NE SW Section 20-3s-3w, dry and abandoned at 1,342 ft., Benoist sand topped at 1,326 ft. Armer and others' No. 1 Norwicki, NE cor. SW¼ Section 33-3s-1w, dry Benoist sand at 1,333-48 ft., dry and abandoned.

In Washington County, Shell Oil Co.'s No. 1 Bernrenter, SW SW NW Section 14-3s-3w, Benoist sand at 1,260-70 ft., shot with 6 qt., pumped 13 bbl.

In Perry County Gilliam and others' No. 1 Brostmeyer, SW SE NE Section 5-5s-3w, dry and abandoned at 1,610 ft. Benoist sand topped at 1,360 ft. W. B. Hayes' No. 1 Old Ben Coal Co., SE SW SE Section 26-5s-1e, dry and abandoned at 3,101 ft.; St. Louis lime top at 2,920 ft.

New Wildcat Operations

In Edgar County Sam J. Burkitt's No. 1 Schoitker, 448 ft. from the south and 220 ft. from the east lines of NE SE Section 30-16n-11w, of second principal meridian, location. Sanders & Walton's No. 2 Weaver, NW SW NW Section 24-14n-14w, drilling at 50 ft. "John Doe's" No. 1 Meyers, SE SE NW Section 29-13n-13w (a mystery well), drilling below 2,600 ft. Morris Yeager's No. 1 Hannah, 400 ft. from north and 400 ft. from west lines, Section 11-12n-13w, drilling at 525 ft.

In Fayette County Max Conrey's No. 1 Bart Smith, NE cor. NW¼ Section 6-5n-3e, rigging up rotary.

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WESTERN KENTUCKY

OWENSBORO, Ky., Oct. 23.—Fifteen wells were reported completed in western Kentucky fields in the past week's review of operations, 11 of which were oil wells with a total initial production of 445 bbl. The best well of the week was a 120-bbl. completion from McClosky lime in the Corydon field in Henderson County. Eight new operations were started. Following is the record of the week:

Breckinridge County, Glen Dean district, Kimmell and Parks' No. 1 Federal Land Bank, drilling at 80 ft. Jack Cooper's No. 8 Earl Moorman, drilling at 300 ft. Hardinsburg district, Lion Oil & Refining Co.'s No. 1 Fannie McCoy, dry and abandoned at 1,600 ft.

Butler County, Gillstrap district, Hume and Steel's No. 1 T. E. Carwile, spudding in. Morgantown district, Henry & Ross' No. 1 Forsyle and Neal, drilling at 675 ft.

Daviess County, Sutherland district, J. C. Miller, trustee's No. 2 J. W. Bell, moving in. Handyville district, A. D. Schaffer and others' No. 2 Burns Brothers,

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OHIO

NEWARK, Ohio, Oct. 23.—Seven gas wells, four oil wells and four dry holes were completed in the Central Ohio fields. A 4,000,000-cu. ft. gasser was completed 3 miles north of the present Newark pool in Licking County. A Morgan County test is being drilled to the Clinton sand. Greene County is to have another sub-Trenton test.

In Cuyahoga County, Independence Township, L. F. McGrath's No. 1 William Melber, Lot 2, Tract 18, has an open flow of 100,000 cu. ft. of gas from the Little lime at 2,909-23 ft.; Clinton sand was dry, total depth 3,021 ft.

In Knox County, Butler Township, Brooks Johnson and others' No. 1 Deville Bricker, Section 5, gaged 330,000 cu. ft. of gas from Clinton sand at 2,893 ft. In Union Township Upham Gas Co.'s No. 2 Jesse White, Section 23, made 20 bbl. of oil first 24 hours after shot, Clinton at 2,901-16 ft.

In Licking County, Newton Township, C. O. Moore and others' No. 1 Ed Heller, NE cor. of first quarter, is a gas well in the Clinton, good for 4,000,000 cu. ft. open flow at a total depth of 2,552 ft. In Mary Ann

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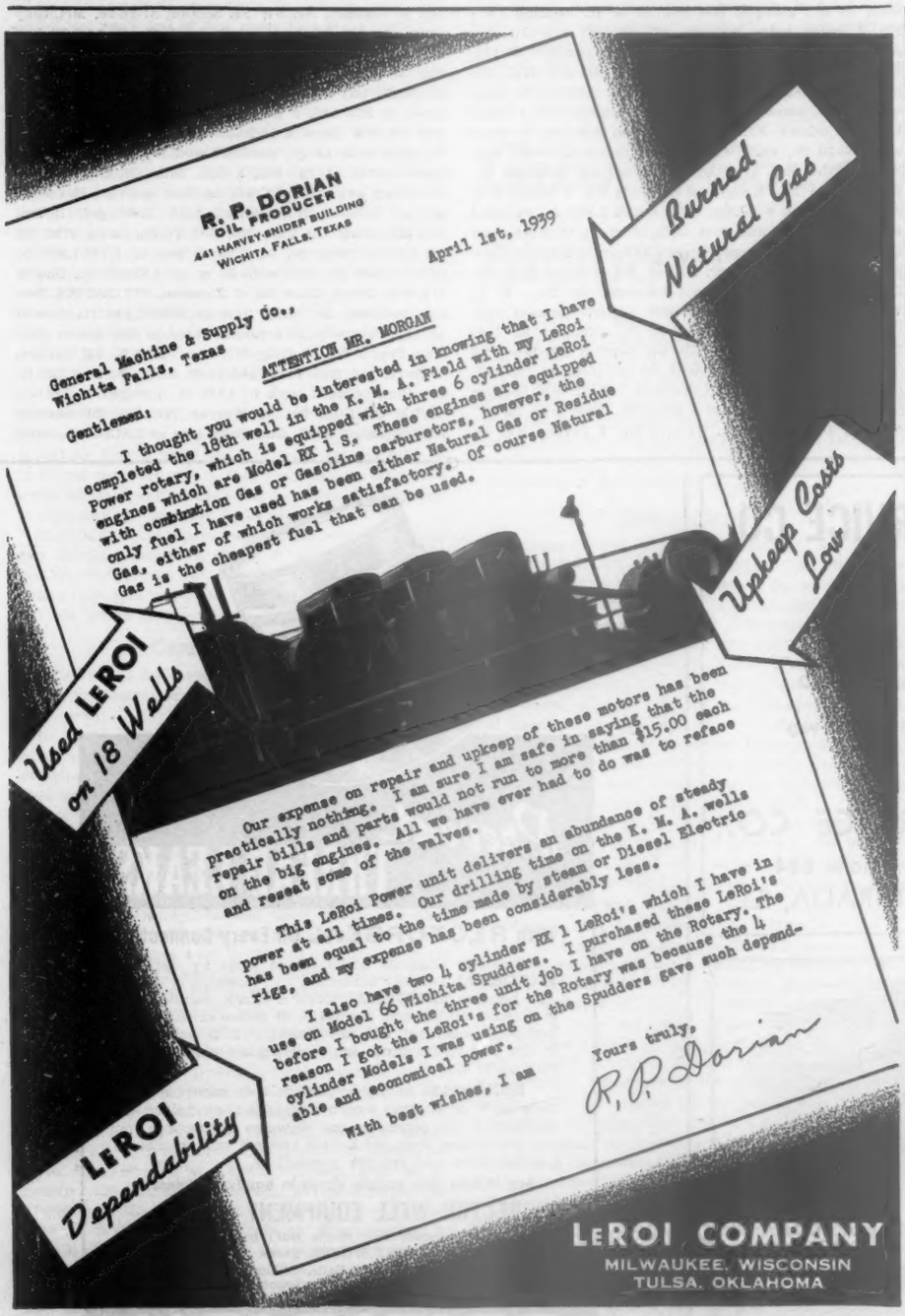
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Gentlemen:
I thought you would be interested in knowing that I have completed the 18th well in the K. M. A. Field with my LeRoi Power rotary, which is equipped with three 6 cylinder LeRoi engines which are Model HX 1 S. These engines are equipped with combination Gas or Gasoline carburetors, however, the only fuel I have used has been either Natural Gas or Residue Gas, either of which works satisfactory. Of course Natural Gas is the cheapest fuel that can be used.
Our expense on repair and upkeep of these motors has been practically nothing. I am sure I am safe in saying that the repair bills and parts would not run to more than $15.00 each on the big engines. All we have ever had to do was to reface and reseat some of the valves.
This LeRoi Power unit delivers an abundance of steady power at all times. Our drilling time on the K. M. A. wells has been equal to the time made by steam or Diesel Electric rigs, and my expense has been considerably less.
I also have two 4 cylinder HX 1 LeRoi's which I have in use on Model 66 Wichita Spudders. I purchased these LeRoi's before I bought the three unit job I have on the Rotary. The reason I got the LeRoi's for the Rotary was because the 4 cylinder Models I was using on the Spudders gave such dependable and economical power.
With best wishes, I am
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HOUSTON • DALLAS • KILGORE • BROWNWOOD • CORPUS CHRISTI, TEXAS

North Louisiana, Arkansas

By GEORGE WEBER

Lisbon Deep Test Shows Oil; Yazoo County Developments

SHREVEPORT, La., Oct. 23.—The Lisbon field of Claiborne Parish is again in the spotlight this week, with a show of oil and gas in the deep lower Marine exploratory test. It threatened to blow out and operators were forced to shut it in. In addition to this deep test, the Yazoo area of Mississippi, otherwise known as the Tinsley dome, is being closely watched as extensions seem proven on the northeast and south, but the sand that produces in the discovery well is missing in the well north of the discovery. Routine drilling was maintained throughout the remainder of the four-state area, with interest centering on two Arkansas wildcats just beginning, and North Louisiana's deep tests at Pine Island and Elm Grove.

Lisbon Test

The Lisbon Exploration Co.'s No. 1 Roberta Vaughan, a cooperative deep test in the Lisbon field, financed by operators and other interested parties, is showing possibilities for deeper production. Following the trend of much of the deep drilling in that area, operators took over the former L. O. McMillan's No. 1 Vaughan in the completed lower Glen Rose horizon, for the purpose of carrying it to 8,500 ft. and exploring the Travis Peak and lower Marine horizons.

The Travis Peak section showed little, excepting occasional shows of gas, as indicated by a special gas-detecting device installed at the rig. The lower Marine formation was topped at 7,833 ft., and two sands at 8,360-78 ft. and 8,459-68 ft. showed possibilities. At the first depth, a maximum of 3½ ft. of porous sand with a strong show of gas was found. Following these showings the organization decided to carry the well to 9,000 ft., set casing and test the two sections.

Bottomed at 8,507 ft., operators ran a Schlumberger survey, checking the showings. While the crew was attempting to run back to the hole, mud began blowing out, and oil and gas appeared at the surface. The mud was then weighted and operators were nearly back on bottom at latest report.

This test is one of considerable importance to Lisbon operators, whose production in the lower Glen Rose has suffered from early over-drilling, price reductions and cuts in allowable production in the past several months. The discovery of lower Marine production, corresponding to the deep production which revived the old Cotton Valley field, will constitute a most important development in the field, which has had little activity in the past year.

Mississippi Field

The Tinsley dome, Mississippi's first oil field, located in Yazoo County, northeast of Vicksburg, was an active spot last week, with oil men greatly interested in the outcome of three outpost wells. The north outpost, Union Producing Co.'s No. 1 Stevens, C NW NW Section 13-10n-3w, failed to get the producing sand which flows the company's No. 1 Woodruff, 1,320 ft. north and 660 ft. east of SW cor. Section 13-10n-3w, the discovery well. In coring from 4,670-4,776 ft. operators found sandy shale with a slight spotted show of oil insufficient to indicate commercial production. This test is coring ahead below 4,780 ft. in search of deeper possibilities.

Interest centered on O'Brien Brothers and others' No. 1 Stevens, C SW NE Section 13-10n-3w, northeast of the discovery well. The crew cored about 10 ft. of porous saturated sand at 4,480-4,500 ft., and at 4,500-20 ft., recovered 16 ft. of core, of which 2 ft. was porous saturated slightly shaly sand; 3 ft. 8 in. was porous saturated sand, grading to more shaly at the base, and the remaining 10 ft. 4 in. was mottled light gray sandy shale.

A Schlumberger survey showed the top of the Woodruff sand at 4,488-5,010 ft. and the top of the first sand at 4,408 ft. A good pressure showed in the Woodruff sand. From these data the O'Brien well seems to have from 18 to 20 ft. more sand than the discovery well. Casing is being moved into the location and will be set late this week. Union Producing Co. will offset this test shortly.

The third outpost, and the one nearest completion is Union Producing Co.'s No. 1 Perry, C NW NW Section 24-10n-3w, a south outpost to discovery. After a drill-stem test at 4,562-4,603 ft. from which was recovered 49 joints of oil in 4½ minutes, a string of 7-in. casing was set at 4,577 ft. The well is being washed in and at latest reports was making 45 bbl. per hour of wash water with no show of oil. Completion is expected over the week end.

Deep Wildcats

In North Louisiana, two deep wildcats of considerable interest are past markers without show of production. In the old Pine Island field, Stanolind Oil & Gas Co.'s No. 131 Dillon, topped Smackover lime at 8,952 ft. and was drilling below 9,550 ft. in shale and streaks of lime. Reports are current that the test will be carried to 11,500 ft. instead of the original 10,000 ft. contracted.

In the Elm Grove field, in Bossier Parish, Gulf Refining Co. is drilling red and gray shale below 5,860 ft., having topped Pettit lime at 5,298 ft. No sign of oil has appeared at this depth, but gas, salt water and heavy oil were tested in porous lime at 4,400-25 ft. several days ago.

An Annona-chalk extension to the Converse field of Sabine Parish was brought in, with Oklahoma Texas, trustee's No. 3 Frost Lumber, NE cor. NE SW Section 22-9-13, making 75 bbl. of oil and an estimated 25 bbl. of salt water with flow valves from 1,899 ft., using gas from a total depth of 3,046 ft.

NORTH LOUISIANA COMPLETIONS

Bellevue—Bossier Parish

J. B. Stovall's No. 3 Gayoso, 1,145 ft. north, 68 ft. east of SW cor. Section 14-19-11, salt water and abandoned, total depth 400 ft.

Caddo—Caddo Parish

A. R. Hancock's No. 1-A Standard Oil Co. fee, C NW NW SW Section 17-21-15, salt water and abandoned, total depth 1,777 ft.

Rodessa—Caddo Parish

V. A. Hardin's No. 1 Glassell-Means, 660 ft. south, 609 ft. east of NW cor. Section 9-23-15, 150 bbl., 22/64-in. choke, tubing pressure 230 lb., total depth 6,113 ft.

Homer—Claiborne Parish

Maritsky & Bibby's No. 4 McClung, Section 29-21-7, pumping 5 bbl. oil and much salt water, total depth 1,476 ft.

Urania—Grant Parish

Arrow Drilling Co.'s No. 1 Maxwell, 330 ft. south, 810 ft. west of C Section 9-9-1e, pumping 5 bbl. of oil and much salt water, total 1,537 ft.

Urania—La Salle Parish

Peterson Petroleum Co.'s No. 1 Turnley, C NE SW Section 36-9-2e, dry and abandoned, total depth 1,966 ft.

Converse—Sabine Parish

Oklahoma-Texas trustee's No. 3 Frost Lumber, C NE NE SW Section 22-9-13, flowing 75 bbl. of oil and an estimated 25 bbl. salt water using flow valves. Oil production from 1,899 ft., gas production from total depth 3,046 ft.

Monroe—Union Parish

Memphis Natural Gas Co.'s No. 1 Frost Lumber, Section 14-22-3e, 3,000,000 cu. ft. of gas, rock pressure 1,010 lb., total depth 2,200 ft. W. E. Hope Gas & Oil Co.'s No. 5 Frost Lumber, Section 26-22-3, 2,000,000 cu. ft. of gas, rock pressure 1,010 lb., total depth 2,204 ft.

Production by Pool

Estimated daily gross production all companies week ended October 20, 1939 (in barrels):

NORTH LOUISIANA

Bellevue	505
Caddo light	4,525
Caddo heavy	2,410
Converse	550
Cotton Valley light	*10,240
Cross Lake	4,525
De Soto and Red River	1,120
Elm Grove	330
Haynesville	2,745
Holly	90
Homer	2,750
Lisbon	5,705
Pleasant Hill	90
Rodessa	23,680
Sarepta-Carterville	†290
Sligo	1,235
Sugar Creek	245
Urania	2,550
Zwolle	2,615
Total	66,200

SOUTH ARKANSAS

Atlanta	400
Buckner	2,255
Champagnolle	1,380
Dorcheat	265
El Dorado	1,665
Lewisville	1,160
Lisbon	235
Magnolia	15,450
Miller County	270
Nevada	560
Rodessa	3,110
Schuler	18,240
Smackover light	1,900
Smackover heavy	14,560
Stephens	510
Troy	1,300
Urbana	1,050
Village	1,060
Total	65,370

*3,070 bbl. is distillate. †80 bbl. is distillate.
Texas side of Rodessa field, 27,030 bbl.
Union Producing Co.'s No. 1 Woodruff, Section 13-10n-3w, Yazoo County, Mississippi (Tinsley field), 330 bbl., 32° gravity.

ARKANSAS COMPLETIONS

Magnolia—Columbia County

Standard Oil Co. of Louisiana's No. 1 Gunnells, C SE NW Section 19-17-19, 600 bbl., 4/16-in. choke, casing pressure 1,300 lb., tubing pressure 1,225 lb., total depth 7,558 ft.

EAST TEXAS BORDER COMPLETIONS

Carthage—Panola County

Turner & Smith's No. 1 Panola Development Co., Gillespie Survey, dry and abandoned, total depth 6,434 ft.

To Elect 1940 Officers and Council of A.S.M.E.

NEW YORK.—Election of new officers for 1940 of the American Society of Mechanical Engineers, by letter ballot of the entire membership of 15,000, was announced by C. E. Davies, secretary of the society. The new officers will be installed during the sixtieth annual meeting of the A.S.M.E. in Philadelphia, at the Bellevue-Stratford Hotel, December 4 to 8, 1939. This is the first time since 1890 that an annual meeting of the society is being held outside of New York City.

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Among the Drilling

FALCON-SEABOARD DRILLING Co. is coring at 7,995 ft. on a wildcat in Cameron County, Texas, for Pure Oil Co. It is planning to run Schlumberger at 10,200 ft. on No. 2 Grandison, a wildcat for Gulf Oil Corp., in La Fourche Parish, Louisiana. This company is also drilling at 7,800 ft. on a wildcat near Crowley, La. It is now completing a well for William Helis at 2,600 ft. at Golden Meadows, La., and will drill a "twin" well immediately.

A. L. ANTHONY, drilling contractor of Abilene, Tex., is drilling below 806 ft. with cable tools at a wildcat test for the Joiner Oil Corp. in Val Verde County, West Texas. It is the corporation's No. 1 Sellers, NE NE Section 59, in the southern tip of the county. It was last reported running 8-in. casing to shut off water.

GEORGE LIVERMORE, drilling contractor of Odessa, Tex., has contract for the deep test recently announced by Paul and David Dean and E. C. Hyde, of Fort Worth, Tex., as their No. 1 D. C. Reed, southeastern part of Section 21, Harrison & Brown Survey, Cochran County, West Texas. The test has been spudded and was last reported drilling below 500 ft Location is 6½ miles southwest of the Dean pool and approximately 8½ miles due west of the Duggan pool. Contract depth is 5,100 ft.

RHODES DRILLING CO., Big Spring, Tex., is reported closing a deal with Algord Oil Co. for 320 acres out of the Simpson lands a mile and a half northwest of the recent Green & Owens No. 1 Tipton strike in Nolan County, West Central Texas. Consideration was reported to include a deep test to the new horizon.

MITCHAM BROTHERS Drilling Co., Brownwood, Tex., is indicating a new oil field for Brown County, West Central Texas, at a test being drilled for Wirt Davis and McDonald & Campbell in the W. P. Hill lands. The pool opener topped the Fry sand at 1,309 ft. and after taking 2 ft. of penetration blew in over the derrick. After tubing was run the well settled down to a flow of 15 bbl. hourly, with 1,000,000 ft. of gas daily. Location is in an area which formerly produced; however, the new production is from a shallower sand. The well is 3 miles northeast of the Smith-Ellis pool and 6 miles northeast of the Fry-sand pool. It is a mile and a half north of the George pool. Operators plan to skid rig and start another well under a rapid development program for their 350 acres. Mitcham Brothers will be the contractor. The new pool opener is specifically located in the east 123 acres of the W. P. Hill tract, which is in the west 213 acres of the Myrum Mudgett Survey 63.

S. B. ROBERTS DRILLING CO., Abilene, Tex., is drilling a new Palo Pinto-lime wildcat test in the southeastern part of Jones County, West Central Texas. The drilling company, together with Owens-Snebold Oil Corp., Fort Worth, is drilling below 1,100 ft. at their No. 1 Jeffreys, NE¼ Section 7, Block 15, T.&P. Survey. Location is a quarter-mile west of nearest production in the shallow Sandy Ridge pool.

L. T. (BOBBY) BURNS, Wichita Falls, Tex., has staked a new half-mile-west outpost on the extreme northern end of the Hull-Silk pool of northern Archer County, North Texas. It is his No. 1 H. Wilmot, a 4,400-ft. rotary test located 330 ft. from the south and east lines of the tract in the G. N. Smith Survey, Abstract 393. The location falls a half mile west of the operator's No. 5 Aherns, Block 127, Abner Nails Survey, on the extreme northwestern end of the pool.

NOBLE DRILLING CO. is moving two rotaries to the Martha field, Liberty County, Texas, for Stanolind Oil & Gas Co. The latter company recently made locations for approximately seven wells and intends to carry on a consistent drilling campaign until the structure is defined.

T. A. CARLTON is rigging up 2 miles north of the town of Satsuma, Harris County, Texas, for Dick Schwab's No. 1 W. H. Robertson, a projected 6,800-ft. wildcat located in the Andrew Lawson Survey.

McDANNALD OIL CO. is preparing to spud a deep test, just southwest of the Mykawa field in Brazoria County, Texas. The well is located on the Clayton Brown lease in the H.T.&B. Survey No. 7.

GEORGE ECHOLS is drilling below 3,000 ft. on Titanic Oil Co.'s No. 1 Allen, a flank test located on the old Allen dome, Brazoria County, Texas, while in the South China field, Jefferson County, one rotary is operating for Hebert & Smith.

N. W. HUNTER is rigging up on the Addicks prospect, Harris County, Texas, for Temple Hargrove and others' No. 1 Herman Hospital, a

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7,500-ft. wildcat located in the William Hardin Survey.

DAVID B. MacDANIEL is preparing to spud his No. 1 Hattie O. Baldwin, a wildcat located southwest of Tamina Station in southern Montgomery County, Texas. The well will be drilled to the Cockfield sand, and if the well fails to find production the hole will be carried to the Tertiary Wilcox formation, which is expected to be encountered between 8,000 and 9,000 ft.

HOUSH & THOMPSON received contract from Gulf Oil Corp. for a 9,000-ft. wildcat to be drilled in eastern Fort Bend County, Texas, on the Russell Brown lease in the William Pettus Survey.

JORDAN DRILLING CO. staked location for a deep test in the Segno field, Polk County, Texas, and a rotary will be moved in within the next few days for No. 1 E. H. Hughes, I.&G.N. Survey, Section 13.

JACK FRAZIER is moving a rotary to the Juliff area, Brazoria County, Texas, for a 9,200-ft. wildcat which will be drilled jointly with John Mayo. The well is located on the Darrington State Prison farm in the A. McFarlin Survey.

TRINITY DRILLERS, INC., is moving a rig to Jim Wells County, Texas, for a Frio-Vicksburg test located on the Temple Lumber Co. Block 28 of the Hancock, Loving & Ruby subdivision in Los Presenos de Arriba grant.

ALLEN & MORRIS completed No. 3 Baldwin in the East White Point field, San Patricio County, Texas, as a good producer and have three other operations in La Rosa and Agua Dulce fields for the Coronado Corp., Process Oil Co. and the Agua Dulce Oil Co.

BILL LEWIS, Mount Vernon, Ill., reached 4,670 ft. last week on his contract for drilling the Gulf Refining Co.'s No. 2 U. S. Fuel, NW NE NE Section 35-5s-3e, Franklin County, Illinois. The Devonian lime was topped at 4,628 ft. At the present time this is the deepest test ever drilled in Franklin County and may eventually approach the state's record depth.

MAX CONREY rigged up a steam rotary rig for the drilling of his No. 1 Bert Smith, NE NE NW Section 6-5n-3e, Lone Grove Township, Fayette County, Illinois. The test will be carried to the McClosky.

HERNDON DRILLING CO., Mayo Building, Tulsa, was testing the Aux Vases sand in the Continental No. 1 Phil Hanna, Section 28-5s-9e, White County, Illinois. The test had water in the McClosky and was plugging back for the purpose of determining the content of upper potential pay zones.

FAIN DRILLING CO. has been recementing the liner at Continental Oil Co.'s No. 1 Proctor, NW¼ Section 28-10-20w, Washita County, Oklahoma. The well is between Canute and Elk City. Bottom of the hole is at 14,540 ft. It is the deepest well in the process of being drilled in the world today.

A. O. OLSON, of Shreveport, La., has the contract on the deep Lisbon Exploration Co.' s No. 1 Roberta Vaughan, which threatened to blow out in the lower Marine. The test, drilling below the lower Glen Rose producing formation of the Lisbon field, Claiborne Parish, Louisiana, has cored two sand sections in the lower Marine, which show indications of oil or gas production.

AMERICAN DRILLING CO., 608 Second National Bank Building, Saginaw, Mich., got a nice well in the Freeman-Redding (Van Horn) pool in Clare County, Michigan. It was the No. 7 Newcomer, C S½ NE NE Section 32-19n-6w, which flowed 70 bbl. per hour when completed at a total depth of 3,891 ft.

TWIN DRILLING CO., Thompson Building, Tulsa, completed its No. 1 Park, in the Walker-Wyoming field, Kent County, Michigan, for 115 bbl. in 12 hours. The Traverse pay was topped at 1,891 ft. and drilling was still in progress when the production test was made.

VOORHEES DRILLING CO. ran casing late last week and was preparing to complete over the week-end on its No. 2 Loew, SW SE SW Section 3-4s-13w, Allegan County, Michigan. The Traverse lime was topped at 1,584 ft.

JOHNSON-KEMNITZ Drilling Co., Oklahoma City, Okla., and McGraw Oil Co., Tulsa, are drilling ahead below 2,867 ft. in the Viola lime at No. 1 Neff-Godfrey, SW SE NE Section 14-6s-6e, near Aylesworth in the eastern end of Marshall County, Oklahoma.

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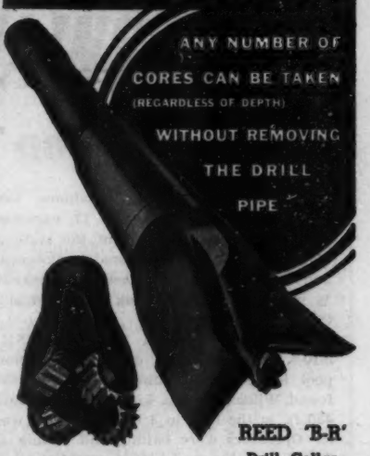

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Oklahoma Operations

By
DAL DALRYMPLE

Wildcat Operations Spurt as 17 Outpost Tests Are Started

Wildcat operations in Oklahoma took a decided spurt the past week, with 17 exploratory tests in widely separated sections of the state announced. A discovery well was completed in Pottawatomie County and the Altus pool in Jackson County was extended ½ mile westward. Testing continued at an Oklahoma County discovery well.

George Deck's No. 1 Newell, SE NE NW Section 3-10-5, apparently has extended the North Earlsboro pool in Seminole County ¼ mile northwestward. It found Wilcox sand at 4,623 ft. and at 4,625 ft. oil rose 450 ft. in the hole in 5 hours. Casing was set at 4,560 ft. Operators were bailing and testing and may drill deeper into the pay before completing.

John Graham of Chickasha staked location for No. 1 Thomas, NE NE SW Section 19-5-7w, on a recently acquired spread of leases east of the Chickasha gas field, Grady County.

Ed Parsons of Duncan was due to start work at No. 1 Brewer, C E½ SE NW Section 10-2n-9w, in Stephens County, near the Comanche County line. Location is west of a 3,016-ft. dry hole.

Elmer Panner's No. 1 Johnson, SW SE SW Section 27-6-3e, 1½ miles southwest of the West Asher pool, Pottawatomie County, had started work. It is southwest of a 3,658-ft. dry hole.

Other new outpost tests were in Muskogee, Pawnee, Kay, Jackson, Caddo, Cleveland, Garfield, Cotton, Garvin, Seminole, Pottawatomie and McIntosh counties.

Hall-Briscoe, Inc.'s No. 1 Thompson, SW SW NE Section 28-13-1e, wildcat east of Jones, Oklahoma County, was testing on the pump. It pumped 40 bbl. of oil and 11 bbl. of drilling fluid and sediment, with no salt water, in the first 5 hours. Production is from Cleveland sand through perforations in casing at 4,796-4,808 ft.

Among the Wildcats

S. D. Butcher and others' No. 1 Mikish, SW SW NW Section 36-10-4, discovery well northwest of the Earlsboro area, Pottawatomie County, was completed after flowing 1,084 bbl. of oil through ½-in. choke in 24 hours. Hunton lime was found at 4,270 ft. and production was from that formation through perforations in casing at 4,265-83 ft. It flowed 533 bbl. of oil in the first 3 hours. The oil tested 42-gravity at 120° temperature. Other formation tops were: Sylvan shale, 4,285 ft.; Viola lime, 4,395 ft.; dolomite, 4,448 ft.; Wilcox sand, 4,529 ft.; total depth, 4,532 ft.

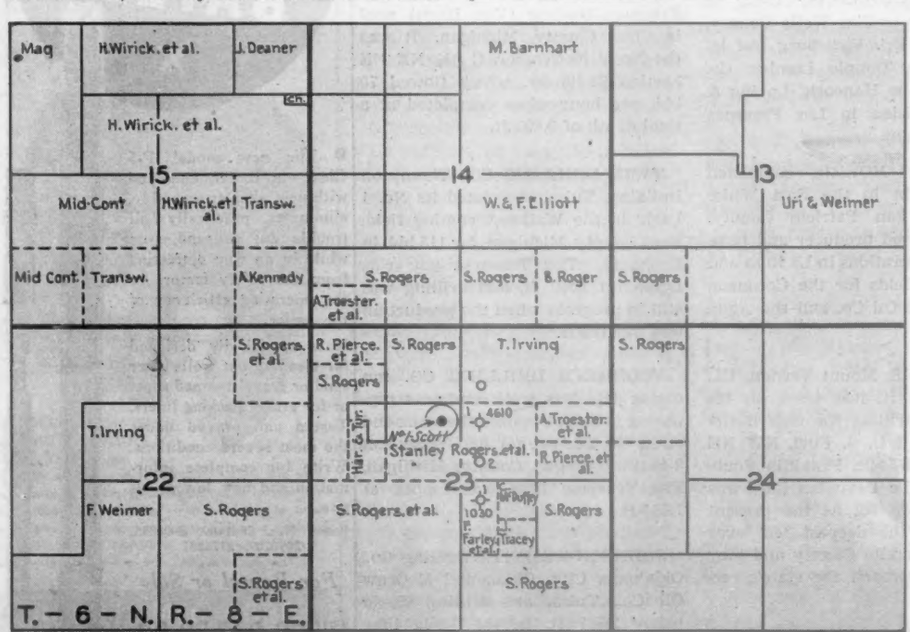
Simpson-Roodhouse Drilling Co.'s No. 1 McKoy, SW SW NE Section 1-2n-7e, wildcat northeast of the Fitts field, Pontotoc County, topped McLish formation at 2,700 ft., had basal McLish at 2,850 ft., and was dry and abandoned at 2,859 ft., total depth.

C. C. Marchant's No. 1 Phillips, C W½ SW NE Section 8-4-5, wildcat southeast of the Bebee pool, Pontotoc County, found Wilcox sand at 2,145 ft., water intruded and it was abandoned at 2,160 ft., total depth.

Batson's No. 1 Vanderslice, C SW SW Section 25-2n-2e, old wildcat in Murray County, was plugged back from 3,001 ft., to 1,836 ft., then to 1,110 ft., ripped casing without results, and was dry and abandoned.

Scruggs and others' No. 1 Lanning, SE SW SW Section 19-12-15, near Hitchita, McIntosh County, topped Wilcox sand at 3,515 ft., had a hole full of water and was abandoned at 3,540 ft., total depth.

New wildcat operations: R. Garrett's No. 1 Escoe, SW SW SE Section 16-13-17, northwest of Oktaha, Muskogee County, was a rig. Atkinson's No. 1 Wilkerson, NW NE NW Section 14-22-4, northwest of Pawnee, Pawnee County, was a location. Dave Malernee's No. 1 Harris, C SW NE Section 14-25-1e, west of Ponca City pool, Kay County, was a location. Bob Helton and others' No. 1 Lee, NE SE NW Section 36-2n-19w, southeast of Headrick, Jackson County, contracted to 1,500 ft., drilling below 200 ft. Ray Stephens, Inc.'s No. 1 Rector, SW SW SE Section 15-6-10w, north of the west extension of Cement field, Caddo County, had dug pits. W. H. Hollenbach's No. 1 McAllister, NW NW SE Section 30-9-1w, east of Norman, Cleveland County, was building rig. Bob Rucker and others' No. 1 Foster, NE NE SE Section 17-9-2w, north of Norman, Cleveland County, was a cellar. Eagle Oil Co.'s No. 1 La Grange, NW NW NW Section 8-23-3w, northwest of the Barnes pool, Garfield County, was building rig and moving in tools. McCarty & Coleman's No. 1 Jones, SE SE SE Section 24-4s-10w, southeastern Cotton County, a 1,600-ft. test, was drilling below 190 ft. Duckworth & Jennings' No. 1 Bowie, NW NE SE Section 3-4-3e, about 4 miles northeast of Stratford, northeast Garvin County, set 10-in. casing at 60 ft. and was waiting on cement. Kimmel's No. 1 Thomas, SE NE NE Section 34-7-5, southeast of St. Louis extension area, Seminole County, was a rig. George Pace and others' No. 1 Whitehead, SW SW SE Section 36-10-3e, between Shawnee and Tecumseh, Pottawatomie County, was a cellar. United's No. 1-A Adams, C SW NW Section 29-12-15, McIntosh County, was a machine.



Midcontinent Map Co., Tulsa

Stanley Rogers and associates' No. 1 Scott, NE SE NW Section 23-6-8, opened a Dutcher-sand pool southeast of the Fish pool in Hughes County. It was showing for a small producer in sand at 2,646-76 ft. Two additional tests have been located in the area

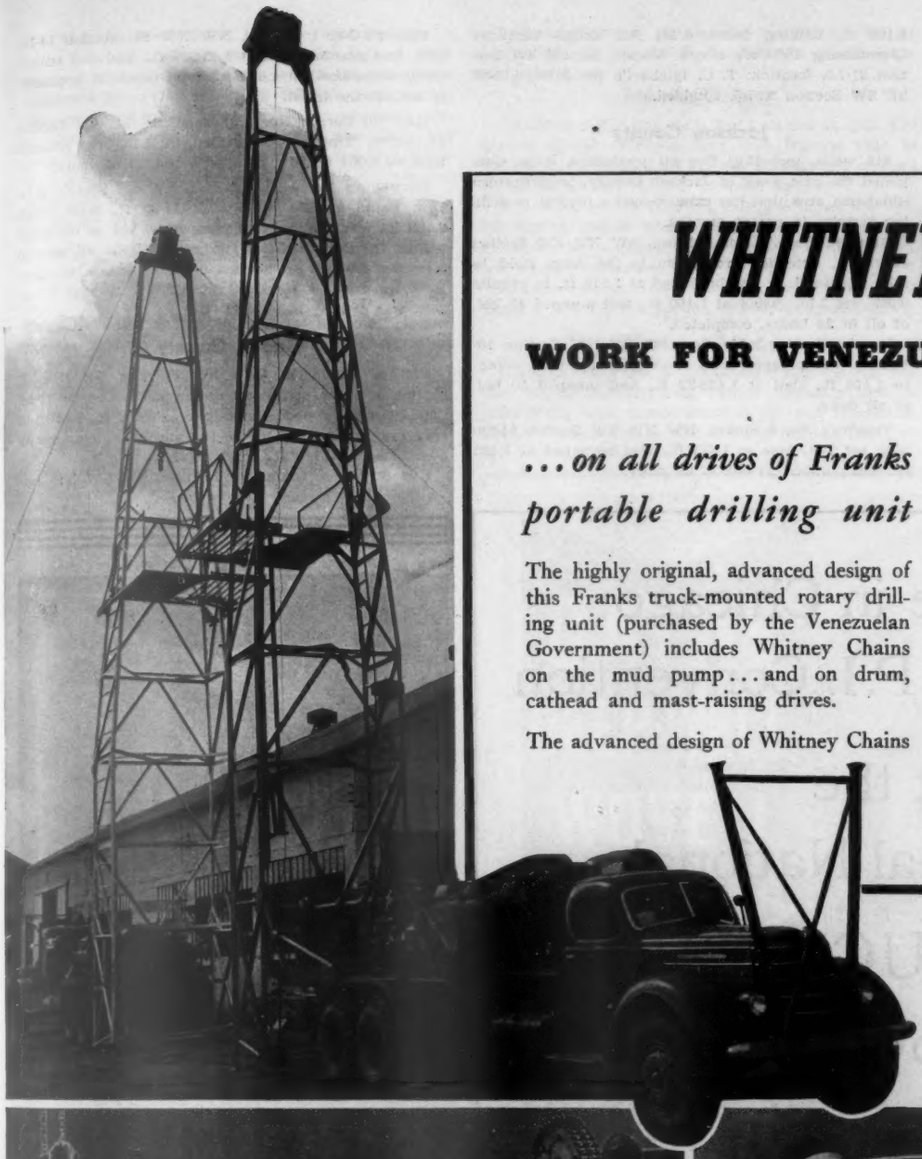
Estimated Daily Production

Estimated daily production for Oklahoma for the week ended October 21, and for the preceding week was as follows:

	Barrels	
	Oct. 21	Oct. 14
Allen	5,775	5,725
Billings	5,975	5,925
Burbank	7,100	7,100
South Burbank	9,125	8,625
Balance Osage	17,700	17,000
Blackwell district	3,375	3,250
Bristow-Slick	6,500	6,500
Chandler	1,425	1,400
Crescent	2,650	2,600
Cromwell	3,025	3,025
Cushing-Shamrock	9,325	9,300
Duncan	3,775	3,650
Edmond	4,375	4,225
Fish	3,975	3,850
Fitts	20,325	20,900
Jesse	2,200	1,975
Graham-Fox	2,900	2,950
Gray	750	700
Healdton	9,300	9,175
Hewitt	3,825	3,675
Keokuk	3,375	3,075
Konawa	1,125	1,075
Lucien	8,325	8,275
Moore	2,750	2,600
Oklahoma City	104,100	108,625
Olympic	2,550	2,075
Ramsey	4,850	4,650
Sasakwa	1,175	1,075
Sholem-Alechem	2,700	2,625
Seminole district:		
Bowlegs	7,025	7,025
Carr City	2,300	2,300
Dora	2,925	2,775
Earlsboro	4,250	4,125
South Earlsboro	500	475
East Earlsboro	2,650	2,550
Little River	6,150	6,025
East Little River	725	675
Maud	625	575
Mission	1,250	1,200
Seminole	6,725	6,525
East Seminole	1,150	1,025
Searight	2,125	1,850
Total Seminole	38,400	37,125
St. Louis-Pearson	31,500	31,300
Tatums	1,750	1,525
Tonkawa-Garber-Thomas	3,875	3,875
Wewoka	1,725	1,675
Yale-Jennings	3,375	3,325
Other pools	90,125	90,900
Total Oklahoma	425,100	425,350

Pottawatomie County

Magnolia Petroleum Co.'s No. 5 Billington B, NE NE NE Section 21-7-5, St. Louis district, Pottawatomie County, found Calvin sand at 2,774 ft., total depth 2,778 ft., and flowed 60 bbl. of oil in 24 hours. Smith's No. 2 McDaniels, SE SW NE Section 31-7-5, topped dolomite at 4,182 ft., was bottomed at 4,281 ft., acidized and swabbed 60 bbl. of oil and 600 bbl. of water in 24 hours. Denver Oil & Refining Co.'s No. 1 Hurford, C N½ N½ SE Section 2-6-4, an old St. Louis well, was deepened from 4,177 ft. to 4,315 ft., pumped



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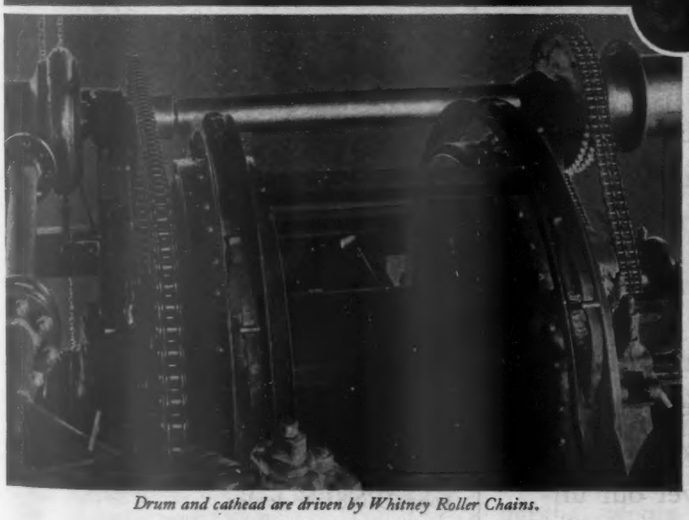
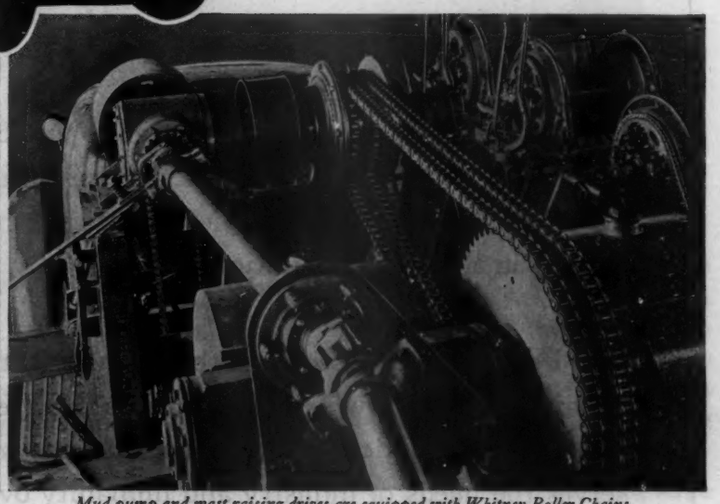


Drum and cathead are driven by Whitney Roller Chains.



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20 bbl. of oil and 2,400 bbl. of water and was abandoned.

Stanolind Oil & Gas Co.'s No. 1 Palmer, NW NW NW Section 26-6-7, an old well in Sasakwa townsite area, was deepened from 4,051 ft. to second Wilcox sand at 4,138-4,175 ft., total depth, plugged back to 4,062 ft., ripped casing at 3,900-4,006 ft., was acidized and pumped 65 bbl. of oil and 240 bbl. of water in 24 hours.

Yorkan Production Co.'s No. 2 Williams, NE SE NE Section 6-10-4, Shawnee pool, found Earlsboro zone at 4,398 ft., total depth 4,453 ft., and flowed 209 bbl. of oil in 24 hours.

New work in Pottawatomie County: T. C. Iglehart's No. 1 Richards, NE NE NW Section 8-6-5, cellar; Alma Oil Co.'s No. 2 Johnson, NW NW SW Section 19-6-5, cellar and pits; Mudge Oil Co.'s No. 4 Baptiste, NE SE NE Section 20-7-4, location; Phillaine Oil Co.'s No. 2 Garrett, NE SE NW Section 28-7-4, an old well being deepened from 4,226 ft., drilling below 4,265 ft.; Sinclair Prairie Oil Co.'s No. 4 Deatheridge, SW NE NW Section 28-7-4, an old well, being deepened from 4,162 ft., drilling below 4,284 ft.; Indian Territory Illuminating Oil Co.'s No. 4 Weems, SE SE SW Section 21-7-5, location; T. C. Iglehart's No. 2 Boyd, NW SE SW Section 28-7-5, spudded.

Jackson County

Six wells, including five oil producers, were completed the past week in Jackson County, southwestern Oklahoma area that has expenienced a revival in drilling activity in recent months.

Gulf Oil Corp.'s No. 1 Enos, NW NE NE Section 16-1n-20w, extended production in the Altus field ½ mile westward. It was bottomed at 1,545 ft. in granite wash, set 7-in. casing at 1,450 ft., and pumped 43 bbl. of oil in 24 hours, completed.

Burnham's No. 3 Hensley, SW SE NW Section 10-1n-20w, was plugged back from 1,562 ft., total depth, to 1,476 ft., shot at 1,422-32 ft., and pumped 50 bbl. of oil daily.

Vaughn's No. 6 Stokes, NW NW SW Section 11-1n-20w, set 7-in. pipe at 1,335 ft., was bottomed at 1,495 ft., and pumped 25 bbl. of oil daily.

Cotner's No. 1 Grimes, NW NW SE Section 14-1n-20w, had granite wash at 1,424-26 ft., and was temporarily abandoned at 1,605 ft., total depth. It apparently defines the trend.

Gulf Oil Corp.'s No. 1 Jackson, SE SE SW Section 31-1n-19w, Tipton pool, drilled to 2,759 ft., plugged back to 2,668 ft., and pumped 5 bbl. of oil daily.

Burnham's No. 3 Thelma, NE SW SE Section 6-1s-19w, found granite wash at 2,411-20 ft., total depth 2,423 ft., was acidized and pumped 30 bbl. of oil daily.

Gulf Oil Corp.'s No. 2 Herbert, SW SE SE Section 9-1n-20w, SW SE SE Section 9-1n-20w, was a location. Burnham's No. 4 Hensley, SE SE NW Section 10-1n-20w, was drilling below 730 ft.

Caddo County

Phillips Petroleum Co.'s No. 1 Oaks, NE NE SE Section 34-6-10w, southwest sector of the Cement field, Caddo County, topped Rowe lime at 3,402 ft., had sand carrying water at 3,464-97 ft., and was temporarily abandoned at 3,716 ft., total depth.

Ray Stephens, Inc.'s No. 1 Freie, SW SW NE Sec-

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tion 21-6-10w, north offset to same operator's No. 1 DeHeck, which recently extended the Cement field nearly 1 mile northwestward, was a location. Same operator's No. 1 Novotney, SE SE NW Section 21-6-10w, northwest offset to the extension producer, was a cellar. Location for a west offset previously had been announced. In the east sector of the field, Johnson's No. 1 Culp, SW NW SE Section 5-5-9w, had dug cellar and pits, and Ohio Oil Co.'s No. 10 Pau-Kune, NE SE SW Section 3-5-9w, was drilling below 2,670 ft.

Seminole County

Dave Malernee's No. 2 Harrick, SW SW NW Section 34-7-6, Little River district, Seminole County, drilled Earlsboro sand at 3,757-96 ft., total depth, plugged back to 2,785 ft., was shot and pumped 21 bbl. of oil in 24 hours.

First reports of new activity in Seminole County: Wood Oil Co.'s No. 1 Factor, SE SW SW Section 15-7-5; the No. 4 Ashby, SW SE NW Section 22-7-5; the No. 3 Tobin, SE SW NW Section 22-7-5, and the No. 4 Tobin, NW NW NW Section 22-7-5, were locations; Ross Oil Co.'s No. 1 Perry, SE NW SW Section 18-9-7, was a rig.

Pontotoc County

Patsy Oil Co.'s No. 1 Bates, SE SE NW Section 26-2n-7, Fitts field, Pontotoc County, had Hunton lime at 3,903 ft., total depth 3,972 ft., was acidized and flowed 95 bbl. of oil in 30 minutes, making daily potential of 1,544 bbl. of oil, with an estimated 8,000,000 cu. ft. of gas. Diamond's No. 1 Howard, NW SW SE Section 34-2n-7, had sand at 1,861-75 ft., total depth 1,877 ft., plugged back to 1,876 ft., was shot and pumped 90 bbl. of oil in 24 hours.

McKower's No. 1 Flatt, SW NE SE Section 36-5-4, Bebee area, topped sand at 2,045 ft., Viola lime 3,090 ft., total depth 3,237 ft., sulfur water intruded and it was plugged back. Casing was perforated at 2,045-57 ft., it was acidized, shot and pumped 2 bbl. of oil daily.

New activity in Pontotoc County: Senora Oil & Gas Co.'s No. 1 Tucker, SW NE NE Section 35-5-4, location; Lloyd's No. 1 Auten, SE NE SW Section 36-5-6, total depth 580 ft., fishing; Minton's No. 4 Powell, NE SW NE Section 35-5-7, location; Sinclair Prairie Oil Co.'s No. 14 Ralls, CEL NE SW Section 28-5-8, pits.

Hughes County

Amerada Petroleum Corp.'s No. 2 Adams, SW NE SW Section 31-9-9, an old well in the Adams area, Hughes County, plugged back was 4,148 ft. to 3,462 ft., perforated casing at 3,345-56 ft., and produced 18,000,000 cu. ft. of gas, with 770 lb. rock pressure.

Lynch's No. 4 Bird, C NE NW Section 5-8-11, about 3 miles southeast of Wetumka, found sand at 1,550-62 ft., total depth, and produced 500,000 cu. ft. of gas, with 355 lb. rock pressure.

Creek County

Bryan Petroleum Co.'s No. 1 Taylor, CSL NE NW Section 22-18-9, Creek County, topped Dutcher sand at 2,805 ft., had oil pay at 2,857-73 ft., drilled Mississippi lime at 2,873-79 ft., total depth, and flowed 50 bbl. of oil naturally in 24 hours. Slemp's No. 1 Self, NW NW SE Section 31-17-10, Kellyville district, found Dutcher sand at 2,660-78 ft., total depth, was shot and pumped 15 bbl. of oil daily.

J. H. Leavell's No. 1 Johnson, SE NW NW Section 7-16-10, an old well, was rigging up machine to deepen from 2,550 ft. Smith's No. 1 Meyer, SE NW NE Section 1-17-10, was drilled below 480 ft. Swift's No. 2 Fields, CWL SW SE Section 7-18-10, was a location.

In Okfuskee County, Olsen's No. 1 Betts, NE SE NE Section 20-13-10, set 12-in. pipe at 80 ft. and was waiting on cement. Hyer's No. 1 Board, SE SW NW Section 10-13-10, an old well being deepened from 2,685 ft., was drilling below 2,750 ft.

Oklahoma County

Hall-Briscoe, Inc.'s No. 1 Hughes, NE SE SW Section 28-13-1e, in the new productive area near Jones, Oklahoma County, was a location. It is a diagonal southwest offset to same operator's No. 1 Thompson, SW SW NE Section 28-13-1e, which is showing as a discovery producer but has not been completed.

Indian Territory Illuminating Oil Co.'s No. 4 Henning, NW SW SE Section 24-11-3w, Oklahoma City field, was building rig. Zeb's No. 1 Highland, NW SW SE Section 26-12-3w, was drilling below 4,900 ft. Kerlyn Oil Co.'s No. 1 Bradley, NE SE SW Section 27-12-3w, was rigging up rotary.

In Garfield County, Sinclair Prairie Oil Co.'s No. 44 West Kisner, C NW NW Section 19-22-3w, Garber area, was a machine.

Lincoln County

Stanolind Oil & Gas Co.'s No. 2 James B, CEL SW Section 35-13-5, Wilzetta area, had Hunton lime at 4,255 ft., total depth 4,284 ft., was acidized and pumped 78 bbl. of oil and 124 bbl. of water daily.

Wilcox Oil & Gas Co.'s No. 6 School Land, NW NW SE Section 16-14-6, was drilling below 1,985 ft. Morgan-Gulf's No. 1 Rubac, C N½ NW NW Section 2-12-5, was rigging up rotary.

In Payne County, Amerada Petroleum Corp.'s No. 1 Hays, C E½ SE SW Section 1-17-1e, was building rig.

Pawnee County

Olson Oil Co.'s No. 1 McCullough, NE NE NE Section 5-23-5, Ralston area, drilled Arbuckle lime at 3,732-97 ft., total depth, and was dry and abandoned. Platter's No. 3 Bunch, NW SW SW Section 4-20-9, an old well deepening from 680 ft., was drilling below 1,700 ft.

In Noble County, Stanolind Oil & Gas Co.'s No. 1 Voss, SW NE SE Section 28-22-2w, an old well in the Polo pool, was plugged back from 4,812 ft., casing ripped at 3,370-75 ft., and it pumped 36 bbl. of oil and 100 bbl. of water daily.

Carter County

Sinclair Prairie Oil Co.'s No. 33 Ardsworth, SW NE NW Section 10-4s-3w, Healdton field, Carter County, was completed at 1,035 ft., total depth, pumping 10 bbl. of oil daily.

Stephens County

Jackson's No. 6 Warden B, SE NE NW Section 34-1s-5w, Stephens County, had sand at 674-694 ft., total depth 725 ft., and pumped 4 bbl. of oil daily.

Carl Carter's No. 1 Spears, NE NE SW Section 15-

(Continued on Page 178)

When drilling crews say GATKE DEEP-WELL WOVEN *"stands the heat and holds in deep well drilling,"* that's only half the story. They know this tough, flexible woven also feeds off with uniform ease at all depths, wears unbelievably long, and is easy on flanges.

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Kansas Developments

By
DAL DALRYMPLE

Pratt County Well Produces 109,177,000 Cu. Ft. of Gas

Field operations in Kansas were featured by a record-setting gas producer in the Pratt County sector of the Cunningham pool; opening of an oil pool in Butler County; indicated extension of the Koblitz pool in Ellis County, and completion of two extensioners in the Wherry field, Rice County.

The Cunningham well was Skelly Oil Co.'s No. 3 Moore, C SW¼ Section 25-27-11w, Pratt County. It produced 109,177,000 cu. ft. of gas daily after acidizing with 1,000 gal. to rate as the biggest gas producer yet completed in the field. Viola lime was topped at 4,048 ft., 5-in. casing was set at 4,050 ft. and was bottomed at 4,066 ft. It is about two-thirds of a mile northwest of Skelly's No. 1 Lakin, C NE¼ Section 36-27-11w, recently completed for 90,000,000 cu. ft. of gas to rate as the biggest producer at that time. The same company completed an 86,807,000-cu. ft. gas well in C SE¼ Section 36-27-11w the past week. Gas produced in the field is purchased by Kansas Power & Light Co., Cities Service Gas Co., and Drillers Gas Co. The Cities Service company completed a new gas pipe line from Cunningham to a connection with its main line at Hutchinson the past week and began taking gas last Friday. The line from Hutchinson extends to eastern Kansas and into Missouri.

Marylyn Oil Co. and others' No. 1 Hoard ranch, SW NE NE Section 28-29-8, uncovered a Mississippi-lime pool in southeastern Butler County. It topped lime at 2,836 ft., drilled to 2,849 ft., and oil rose 300 ft. in the hole after plugs were drilled. It was to be tubed and acidized for production test. Location is ¼ mile west of the Elk County line and about 1½ miles north of the Hannah pool.

Estimated Daily Production

Estimated daily production for Kansas for the week ended October 21, and for the preceding week was as follows:

	Barrels	
	Oct. 21	Oct. 14
Oxford City	750	800
Burrton	10,600	10,100
Ritz-Canton	4,550	4,400
Graber	2,875	2,675
Hollow-Nikkel	2,000	1,925
Lerado	1,050	975
Voshell	1,775	1,725
Wellington	2,275	2,175
Ellsworth County:		
Lorraine	2,425	2,050
Other pools	1,960	5,525
Rice-Barton counties:		
Bloomer	3,050	3,150
Chase	4,200	4,675
Geneseo	4,450	3,550
Raymond	425	700
Silica	12,550	11,350
South Silica	2,500	2,350
Keesling	1,025	950
Wherry	4,350	4,025
Miscellaneous Rice	5,395	4,675
Miscellaneous Barton	8,950	8,975
Russell County	27,685	26,925
Sedgwick County	3,550	3,225
Ellis County:		
Bemis	6,825	6,525
Miscellaneous	3,870	3,395
Kingman County	730	715
Stafford County	6,320	4,255
Greenwood County	8,600	8,750
El Dorado	7,625	7,650
Other fields	32,500	30,145
Total Kansas	174,850	164,125

Skelly Oil Co.'s No. 1 Koblitz, C E½ SE NE Section 22-12-18w, ¼ mile west of production in the Koblitz pool, Ellis County, was bottomed at 3,677 ft. in Arbuckle lime and oil was reported to have risen 1,550 ft. in the hole in 18 hours. Tanks were being erected, and it was to be cleaned out preparatory to testing.

Dufton & Carlock's No. 1 Renollet, SE SE NE Section 36-20-8w, extended the Wherry pool, Rice County, ¾ mile northwestward when completed for initial potential of 723 bbl. of oil daily at total depth of 3,323 ft. in conglomerate. Gerbrand & Pulse extended Wherry production ¼ mile northward at No. 1 DeWeese, SW SW NE Section 31-20-7w, completed for initial yield of 560 bbl. of oil daily at total depth of 3,315 ft. in conglomerate.

B. O. Hollett and associates were drilling below 1,160 ft. at No. 1 Butler, SE SW SE Section 28-20-15, Coffey County wildcat. Eight-inch casing was set at 709 ft.

Russell County

Coralena Oil Co.'s No. 11 Sellens, C S½ N½ NW Section 17-15-13w, Coralena pool, Russell County, had Arbuckle lime at 3,190-94 ft., total depth, was acidized with 2,000 gal., pumped 102 bbl. of oil in 9 hours and was completed for estimated daily potential of 250 bbl. of oil.

W. I. Southern, Inc.'s No. 3 Sellens, NW NE SE Section 29-15-13w, Trapp field, topped Arbuckle lime at 3,333 ft., was bottomed at 3,337 ft., and pumped 176 bbl. of oil in 8 hours, making 24-hour potential of 531 bbl.

Texon Oil Co.'s No. 2 Rogg, SE NW NW Section 35-14-13w, Hall pool, pumped 526 bbl. of oil in 8 hours and was completed for daily potential of 1,579 bbl. It found Lansing-Kansas City lime at 2,802-54 ft., total depth.

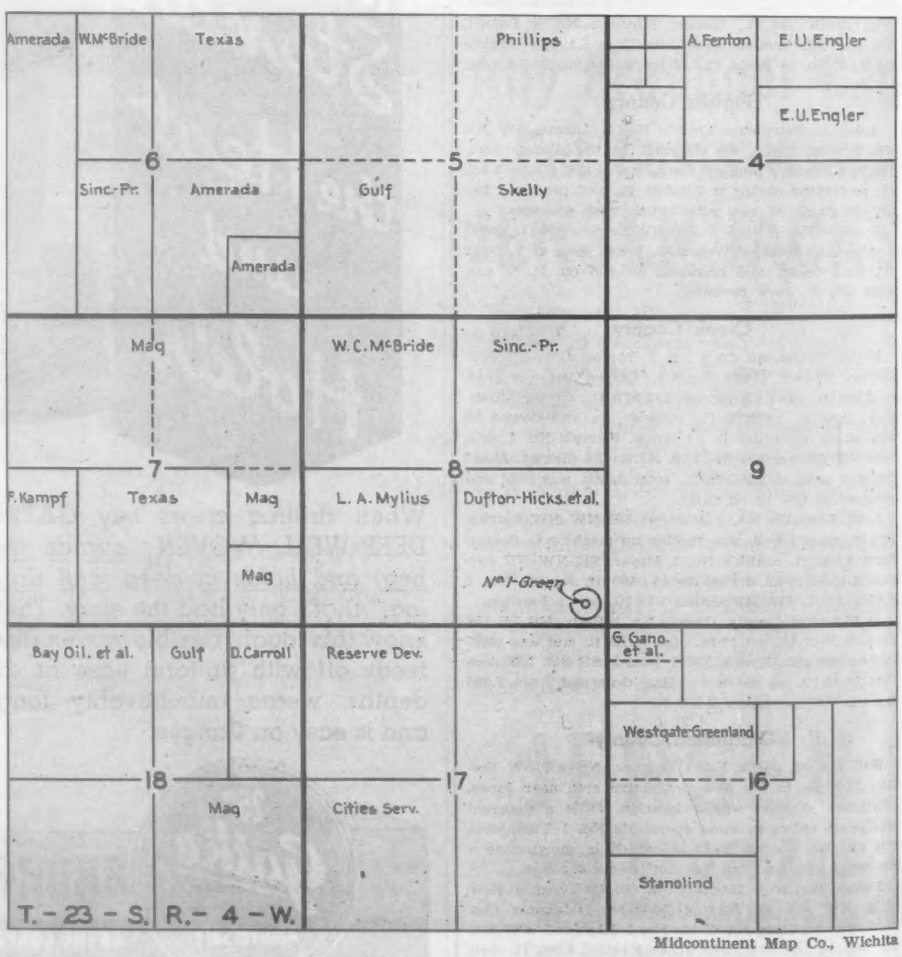
Cities Service Oil Co.'s No. 1 Krug, NW NW SE Section 7-14-14w, was dry and abandoned at 3,344 ft., total depth. It is in the Gorham area.

New operations in Russell County: Cities Service Oil Co.'s No. 1-C Rogg, S½ SW SW Section 21-14-13w, rotary rig; Coralena Oil Co.'s No. 2 Sellens, SW cor. Section 17-15-13w, cellar; Stanolind Oil & Gas Co.'s No. 1-B Sellens, C S½ SE NW Section 19-15-30w, location; Coralena Oil Co.'s No. 6 Sellens, C W½ NW SE Section 20-15-13w, location; W. I. Southern, Inc., was drilling at 145 ft. in a new well in NW NE NE Section 32-15-13w.

Ellis County

Dickey Oil Co.'s No. 1 Husted, C N½ NW SW Section 18-11-17w, South Burnett pool, Ellis County, was completed in Arbuckle lime at 3,333-36 ft., total depth. Oil rose 2,800 ft. in the hole in 1 hour and it was completed for depthograph potential of 10,870 bbl. of oil.

Cities Service Oil Co.'s No. 3 Collahan, SW SW NW Section 24-11-17w, Bemis field, found Arbuckle lime at 3,446 ft. and was bottomed at 3,451 ft. in that formation. Oil rose 2,900 ft. in the hole in 2 hours and it was given echometer potential rating of 34,084 bbl.



Midcontinent Map Co., Wichita

Dufton, Osborne, Hicks and others have started work at No. 1 Green, SE SE SE Section 8-23-4w, wildcat west of the Burrton field and south of the Buhler pool, Reno County

of oil. No gage of actual production on either of these wells was announced.

Virginia Drilling Co. and others' No. 1 Craig, C E½ SE SE Section 5-11-16w, wildcat in Ellis County, was a location.

Howard Wakefield's No. 1 Barbier, SW SE SE Section 1-11-18w, was moving in material.

Rooks County

Bay Petroleum Co.'s No. 1-A Kempe, SW SE SW Section 31-10-17w, Rooks County extension of the Burnett pool, topped Arbuckle lime at 3,584 ft. and was bottomed in lime at 3,588 ft. It was acidized with 1,500 gal., swabbed 30 bbl. of oil an hour and made depthograph potential of 4,784 bbl. of oil.

C. W. Trickett and others' No. 1 Daugherty, C W½ NW NE Section 13-9-17w, new test in Rooks County, was drilling below 1,865 ft.

In Ness County Continental Oil Co.'s No. 1 Unruh, SW SW NE Section 8-18-25w, was building rotary rig.

Rice County

Continental Oil Co.'s No. 5-A Ainsworth, SE SE NW Section 30-18-7w, Geneseo field, Rice County, was acidized with 2,000 gal. and pumped 816 bbl. of oil, with no water, in 8 hours, making potential of 2,447 bbl. daily. Production was from Arbuckle lime at 3,174-4,206 ft., total depth.

Same company's No. 4-A Pickerill, SE SE NE Section 24-18-8w, had Arbuckle lime at 3,087-3,174 ft., total depth, pumped 704 bbl. of oil in 8 hours and made 24-hour potential of 2,113 bbl.

Cities Service Oil Co.'s No. 5 DeWitt, SE NE NE Section 33-19-9w, Campbell pool, found Arbuckle lime at 3,163-94 ft., total depth, oil rose 2,700 ft. in the hole in 26 hours and it made depthograph potential of 4,505 bbl., being completed for maximum allowable of 2,500 bbl. daily.

Barton County

Stanolind Oil & Gas Co.'s No. 3 Thomas, C S½ S½ SW Section 35-19-11w, Silica field, Barton County, pumped 38½ bbl. of oil in 1 hour from Arbuckle lime drilled at 3,285-3,295 ft., total depth, and made daily potential of 3,939 bbl.

Same company's No. 5 Rose, C NE¼ Section 3-20-11w, had Arbuckle lime at 3,290-94 ft., total depth, was treated with 2,000 gal. of acid and swabbed 11½ bbl. of oil an hour. It was reacidized and made daily potential of 2,174 bbl. of oil.

Sinclair Prairie Oil Co.'s No. 4 Prusa, SE SE NE Section 20-16-11w, Prusa pool, drilled Arbuckle lime from 3,290 ft. to 3,302 ft., total depth, oil rose 2,900 ft. in the hole in 8 hours and made potential of 4,361 bbl. of oil, but was completed for maximum potential of 2,500 bbl.

Texas Co.'s No. 1 Fouts, SW cor. Section 4-16-13w, was a location. Skelly Oil Co.'s No. 1 Bird, C SE¼ Section 28-18-15w, was a location.

McPherson County

Fain Drilling Co.'s No. 1 Mattson, C E½ SE NE Section 30-20-5w, Bornholdt pool, McPherson County, penetrated Mississippi lime pay from 3,360 ft. to 3,385 ft., total depth, pumped 199 bbl. of oil in 8 hours and made daily potential of 597 bbl.

Kuns & Funk's well in SE SE NE Section 26-18-1w, North Canton area, was dry and abandoned at 2,873 ft., total depth.

Westgate-Greenland Oil Co.'s No. 1 McCuele, Section 29-17-1w, was location for a wildcat in McPherson County.

Greenwood County

K. T. Weideman's No. 1 Temple, SE SE NW Section 25-27-8, Beaumont pool, Greenwood County, had Mississippi lime pay at 2,416-26 ft., total depth 2,515 ft., and was estimated good for 5 bbl. of oil in 24 hours.

Katz and others' No. 3 Olson, SE SW SE Section 2-25-8, new operation in Greenwood County, was cleaning out at 1,135 ft.

K. T. Weideman's No. 2 Hendrickson, NW NW SE Section 25-27-8, was rigging up machine.

Pratt County

Another big gasser was completed in the Cairo-Cunningham field on the Pratt County side. It was Skelly Oil Co.'s No. 1-B Steffen, C SE¼ Section 36-27-11w. Viola lime was found at 4,108-13 ft., total depth 4,124 ft., and it gaged 6,798,000 cu. ft. of gas naturally. It was acidized and production increased to 86,807,000 cu. ft. daily, with casing pressure of 1,360 lb.

Cowley County

Trees Oil Co.'s No. 2 Pierson, C N½ NE NE Section 19-30-4, Trees area, Cowley County, topped Mississippi lime at 2,917 ft., Arbuckle lime 3,290-97 ft., total depth, the hole filled with water and it was abandoned.

Barnett & Connelly's No. 8 Waite, SW SW NW Section 21-31-4, Hittle pool, was drilling below 275 ft.

Johnson County

F. O. McCain and others' No. 1 Lyons, NW SW NE

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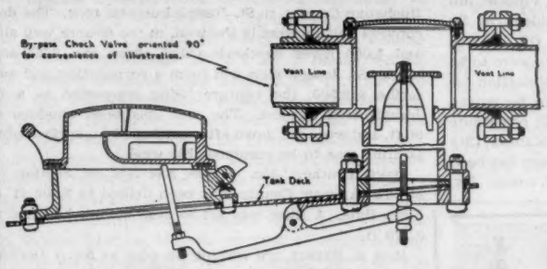

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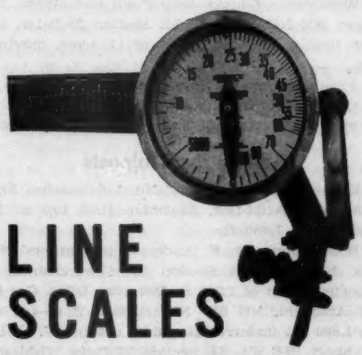

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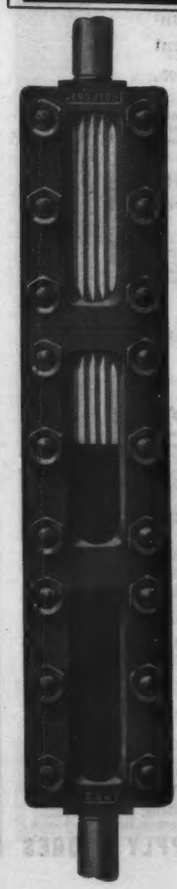

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Section 27-13-22, wildcat in Johnson County, had a hole full of water and was abandoned.

In Jefferson County, E. W. Mosbacher and others' No. 1 McLaughlin, SW NE NW Section 4-10-20, wildcat, had drilled to 125 ft. and was shut down.

Forest City Basin Activity

ST. JOSEPH, Mo., Oct. 23.—Northwest Missouri is regaining the lead in the Forest City Basin play, with the prospect of soon having five deep tests drilling in the St. Joseph area.

In a farmout contract with George A. Vincent, oil man of Medicine Lodge, Kans., now resident in St. Joseph, the Indian Territory Illuminating Oil Co. will test its block in northern Platte County. Pits were to be dug this week at No. 1 Dillingham, NE SW Section 16-53-34w, and a heavy drilling machine is to be moved in soon. The Indian Territory company will contribute to financing the test. Minneapolis and Kansas City interests own acreage in the area. A structure has been mapped, and the area has been shot and cored. Mr. Vincent will be the operator, with Jerry Ladd, now drilling a well in Mercer County, as the contractor. An Arbuckle lime test is planned.

E. F. Neely, of Shreveport, was moving in equipment for a proposed rotary test at No. 1 Shores, SE SE SE Section 13-60-37w, Andrews County. Cellar and pits have been dug and the contract awarded to Crow Drilling Co. of Louisiana. The location, 1 mile west of the town of Fillmore, is on a 3,000-acre Derby Oil Co. block, with Mr. Neely having been given 1,800 acres for the test.

F. C. Miller has announced sale of one-half interest in No. 1 Corrough, C SE SE Section 24-57-35w, Buchanan County, to St. Joseph business men. The deal conveys half interest in the well, in the 80-acre well site, and 1,000 acres checkerboarded about the 3,200-acre block. St. Joseph men will form a corporation and subscribe $12,500, the venture being supported as a St. Joseph civic project. The well has been spudded to 96 ft. and was shut down after setting 15-in. surface pipe. Drilling was to be resumed this week.

Davis Brothers' No. 1 Gee, NW NW SE Section 28-60-35w, Andrew County, has been drilled to 2,525 ft. in Viola lime. A liner was set to stop caving in shale at 2,270 ft.

Brin & Nathan are waiting on pipe at No. 1 Decker, C NW NW Section 1-61-38w, Holt County. Total depth is 1,030 ft.

Other active wells include Moore's No. 1 Moss, NW SW SE Section 30-65-24w, Mercer County, near completion at 1,879 ft. Ward McGinnis was moving in rig for No. 1 Laughlin, SE SE SW Section 18-65-15w, Adair County. C. E. King's No. 1 Vandereau, NE SW Section 18-55-31w, Clinton County, was drilling below 1,334 ft. on the way to 1,750 ft. If no oil is found, it may be plugged back and completed as a gasser at 600 ft., where about 1,904,000 cu. ft. of gas was shut off.

In northeastern Missouri Rodgers, Morrow, and Benedum & Trees' No. 1 Cooley, NW SE SE NW Section 36-64-17w, Adair County, set 8-in. pipe and was to acidize when cement dries to test a showing of oil at 871-86 ft. in Callaway lime.

Illinois Fields

(Continued from Page 148)

In Wayne County Cayanna Oil Co.'s No. 1 Borah, C E½ SW NE Section 23-1s-8e, cellar and pits. South State Development Co.'s No. 1 Grubb, SE SW NW Section 24-2s-8e, drilling at 400 ft.

In Wabash County Pat Wiggins' No. 1 Steckler, NW cor. Section 26-1s-13w, location.

In Edwards County Roscoe Jones' No. 1 Schroeder, SE SW SE Section 27-2s-14w, shut down at 1,950 ft.

In White County W. R. Choate and others' No. 1 Carmi National Bank, NE NE SW Section 8-4s-9e, rig up. O'Meara and others' No. 1 Myrtle Stein, NE cor. SW NW Section 7-4s-11e, rig up.

In Washington County John Pugh and others' No. 1 Kroeger, NE NE NW NW SE Section 28-3s-1w, a Devonian lime test in the center of 11 acres, moving in rotary.

In Franklin County E. S. Adkins' No. 1 Old Ben Coal Co., 305 ft. from south and 990 ft. from west lines of NW¼ Section 21-6s-2e, drilling at 1,520 ft.

Among the Outposts

In Edgar County A. Myers' No. 1 Schneider, SE SE NW Section 29-13n-13w, Devonian lime top at 1,463 ft., drilling at 1,486 ft.

In Bond County R. F. Anderson and others' No. 1 Morris, NW NW NW Section 16-6n-3w, cleaning out at reported depth of 1,200 ft. Devonian Oil & Gas Co.'s No. 1 Ambuehl, NE SW NW Section 22-6n-4w, total depth 1,894 ft., underreaming 6-in. casing. W. N. Lee's No. 1 Short, NE SW SE Section 27-7n-4w, fishing for tools at 1,159 ft.

In Brown County Measley and others' No. 1 Thomas, NE NE NW Section 15-1s-2w, of fourth principal meridian, drilling at 235 ft. F. M. Coleman's No. 1 Newenham, SW cor. NW NE SE Section 7-2s-3w, total depth 157 ft., fishing for tools. J. W. Fairburn's No. 1 Newton, SE cor. SW SW SE Section 33-2s-4w, drilling at 350 ft.

In Clinton County Paul Mosebach, SW SW SE Section 5-1n-3w, drilling at 1,951 ft., Osage lime topped at 1,645 ft. Schnell & Goldschmidt's No. 1 Schaefer, SW NE NW Section 33-2n-3w, drilling at 1,188 ft. with the hole full of water.

In Clark County, west of the second principal meridian. W. R. Miller's No. 1 Pinnell, SE NW SE Section 6-11n-14w, shot three times at 468-86 ft. and at 310-340 ft., has 150 ft. of fluid in the hole. Trenton Oil Co.'s No. 1 Black, C SE NW Section 14-11n-14w, drilling at 2,360 ft., Devonian lime topped at 1,480 ft. W. R. Miller's No. 1 Booth, SE NE NW Section 17-11n-14w, total depth 2,462 ft., shot with 20 qt. at 20 ft. off bottom; filled 1,100 ft. with fluid; could not lower the column in 5 hours of bailing; testing.

In Coles County Daugherty & Dumm's No. 1 Mitchell, NE cor. SE NE SW Section 24-11n-10e, shut down at 210 ft. to make repairs.

In Effingham County Edwin Barr's No. 1 F. Dammerman, NW cor. SW¼ Section 18-8n-4e, shut down at 401 ft. for repairs.

In Fayette County Parrott & South's No. 1 Guffey, NE cor. SE NW NE Section 1-5n-2e, Cypress sand topped at 1,618 ft., drilling at 1,632 ft.

In Ford County Nelson, Brown & Erp's No. 1 Stroh, NE SE NW Section 19-14n-7e, underreaming 6-in. casing at below 985 ft.

In Henderson County Media Oil Co.'s No. 1 Pendarvis, SW NW NW Section 17-9n-4w, fourth principal meridian, last reported drilling below 1,110 ft.

In Fulton County J. H. Spyker's No. 1 fee, C N½

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NE NE Section 3-7n-1e, fourth principal meridian, drilling at 420 ft. F. A. Johnson's No. 1 Owens, SW SE SE Section 16-11n-10w, third principal meridian, fishing for tools at 1,125 ft.

In Jasper County Mammoth Producing & Refining Co.'s No. 1 Johnoff, C E½ NE SE Section 24-5n-9e, estimated drilling at 1,500 ft.; a mystery well.

In Jersey County T. W. Eagleton's No. 1 Schaefer, NE NE SE Section 7-7n-10w, drilling at 610 ft. E. M. Gould's No. 1 Pearce, NW cor. SE SW NE Section 27-8n-10w, drilling below 915 ft.

In Madison County Fred Cary's No. 1 Hassel, SE SE SW Section 11-3n-9w, small showing of oil and drilling at 1,635 ft.

In Menard County William Johnson's No. 1 Johnson, SE NW NE Section 26-19n-5w, drilling at 1,357 ft.

In Montgomery County Boren & Burroughs' No. 1 Jett, NW NE NW Section 30-8n-3w, shut down at 900 ft.

In Peoria County Blue Bell Oil Co.'s No. 1 Kyle, NW SW NW Section 17-8n-6e, fourth principal meridian, drilling at 115 ft.

In Effingham County Turner's No. 1 Hoagland, NW NW SW Section 14-9n-4e, total depth 1,450 ft., underreaming 8-in. casing at 1,450 ft.

In Shelby County Rex Development Co.'s No. 1 Odell, C E½ SE NW Section 20-14n-2e, fishing for tools at 1,465 ft.

In Tazewell County H. V. House's No. 1 Greening, NW NW SE Section 28-24n-2w, drilling below 560 ft.

In Williamson County Adams & Doran's No. 1 Moore, SE NE NE Section 4-10s-3e, fishing at 1,230 ft. J. H. Williams and others' No. 1 Smathers, SE cor. NE NE Section 9-9s-2e, shut down at 900 ft.

In White County Tatum and others' No. 1, NE SW SW Section 23-6s-9e, base of the Pennsylvanian at 1,897 ft., drilling at 2,040 ft. Pyramid Petroleum Co.'s No. 1 Porter, C E½ NW SE Section 12-6s-8e, drilling at 2,470 ft. Continental Oil Co.'s No. 1 Hanna, SE SE NW Section 28-5s-10e, total depth 3,143 ft., filled up with salt and sulfur water; squeeze job with 50 sacks of cement; after cement sets will perforate and test Aux Vases sand at depth not given. Chisom's No. 1 Boultinghouse, CWL SW SW Section 10-4s-14w, second principal meridian, total depth 2,769 ft., swabbed 1 bbl. of oil and 25 bbl. of water in 24 hours, shut down for orders. McIntyre & Johnson's No. 1 Hon, NE NW SE Section 9-4s-14w, total depth 3,003 ft., drilling plug. Phillips Petroleum Co.'s No. 1 Garner, SW cor. NE NE NE Section 36-4s-10e, drilling at 2,256 ft. J. W. Carter and others' No. 1 Johnson, SW NE NE Section 12-4s-10e, drilling at 3,055 ft. with Glen Dean top at 2,482 ft. and Golconda at 2,600 ft. C. A. Evarts' No. 1 Brown, S½ NW NW SW Section 35-4s-9e, drilling at 1,935 ft. Ben Nations' No. 1 Stokes, SE NE SE Section 35-4s-8e, derrick up. Nations Oil Co.'s No. 1 Hammock, NW SE SW Section 6-4s-8e, derrick up. D. F. Morrow's No. 3 Cox, NW NE NE Section 6-4s-8e, testing at 3,285 ft. Kingwood Oil Co.'s No. 1 Metcalf, SW NE SW Section 31-3s-11e, total depth 3,206 ft. Kingwood Oil Co.'s No. 1 Seifreid, NW SE SW Section 30-3s-11e, drilling at 1,630 ft. Kingwood's No. 1 Fearn, SW cor. NE NW Section 19-3s-10e, rigging up standard tools. Bishop, Harrington and others' No. 1 Griffin, S½ SE SE SW Section 28-3s-9e, rigging up rotary. H. H. Weinert, Inc.'s No. 1 Newly, SE SE NW Section 31-3s-8e, Benoist sand top at 3,080 ft., drilling at 3,110 ft. Texas Co.'s No. 1 Poorman, SW SE SE Section 31-3s-8e, drilling at 2,738 ft. Roche Voyles and others' No. 1 Lewis, NW SE NE Section 31-3s-8e, perforated opposite Aux Vases sand; pumped 125 bbl. of fluid 50 per cent water, in 14 hours, testing. Riley & Lacy's No. 1 Dauby, C S½ SW NE Section 31-3s-8e, total depth 3,424 ft., pipe set at 3,411 ft., perforated at 3,312-20 ft., 3,368-72 ft., 3,388-90 ft., filled up 1,400 ft. with fluid in 1 hour; swabbing. T. F. Morrow's No. 1 Gray, trustee, NE NE SE Section 3-3s-8e, after a squeeze job, rigged up standard tools and shut down to make repairs. H. H. Weinert, Inc.'s No. 2 Miller Brothers and Andrews, C N½ SW NW Section 29-3s-8e, McClosky lime top at 3,352 ft., total depth 3,434 ft., perforated pipe at 3,367-74 ft., swabbing salt water with a showing of oil. Weinert's No. 1 Curd, NW SW NE Section 29-3s-8e, perforations at 3,235-55 ft., pumped 135 bbl. of oil and 35 bbl. of salt water; testing. Jorgensen's No. 1 Morgan, NW SW SE Section 21-3s-8e, waiting for rotary. A. B. Cobb's No. 1 Gill, NE NE SW Section 20-3s-8e, rig up. Southern Petroleum Corp.'s No. 1 Walker C, SE SW NW Section 16-3s-9e, set 10-in. casing at 171 ft. C. E. Good's No. 1 Ahrens, SW SE NW Section 36-2s-8e, rig up. Snyder's No. 1 Vaughn, SW NE NW Section 35-2s-8e, set surface pipe.

In Washington County Kingwood Oil Co. had rig up for No. 1 Brink, SE SW SE Section 15-1s-1w.

In St. Clair County Oil Exploration Co.'s No. 1 Whickler, NW NW SE Section 34-2s-6w, drilling at 2,185 ft. T. D. Crittenden's No. 1 Klatz, NE NE NE Section 35-1n-10w, Trenton lime topped at 464 ft.; hole full of oil; set 5⅛-in. casing at 448 ft. and shut down to erect storage.

In Pope County Gardenshire & Smith's No. 1 Peoples, C SE SE Section 19-11s-5e, small showing of dead oil at 975-1,005 ft., drilling at 1,160 ft.

In Perry County Cochrane and others' No. 1 Pyramid Coal Co., NE NW SE Section 35-5s-3w, shut down for orders at 1,655 ft. Fredonia lime topped at 1,613 ft. E. S. Adkins' No. 1 Truax-Traer, SW NE SW Section 25-5s-2w, making repairs, total depth 1,465 ft.; Aux Vases sand topped at 1,360 ft. L. C. Simmell's No. 1 Kimsey, NE NE NW Section 13-5s-2w, drilling at 430 ft.

In Monroe County H. W. Peter's No. 1 Schuster, NW NW SW Section 13-3s-8w, drilling at 1,340 ft. Davis & Brand's No. 1 Krause, CSL, NW SW Section 30-3s-7w, drilling at 75 ft.

In Marion County Dunbar & Wingate's No. 1 Frances, NE NW SW Section 1-4n-4e, drilling at 2,000 ft.

In Wayne County New Penn's No. 1 Xanders, NE SW SW Section 7-2s-9e, drilling at 4,590 ft.

In Jackson County M. C. Trumbull's No. 1 Bennett, C N½ NW NE Section 2-9s-5w, total depth 880 ft., making repairs.

In Hamilton County Alma Oil & Gas Co.'s No. 1 Federal Chemical & Coke, SE SW SE Section 9-7s-6e, drilling at 2,600 ft. Phillips Petroleum Co.'s No. 1 Boyles, NE NW SE Section 19-5s-3e, shut down for orders at 3,073 ft.

In Edwards County Howell & Politis' No. 1 Boster A, NW NW NE Section 3-3s-14w, swabbed 9 bbl. of oil per hour, total depth 2,610 ft., preparing to pump. Noah & Morrison's No. 1 Brown, NW NE NW Section 15-3s-10e, drilling at 1,660 ft. Smith & Broadus' No. 1 Broster, SE cor. SW NW SE Section 34-2s-14w, Cypress sand saturated at 2,625-34 ft., set 5½-in. casing at 2,525 ft. A. A. Potter and others' No. 1 Broster, SW cor. NW SE Section 34-2s-14w, drilling at 1,155-1,955 ft.

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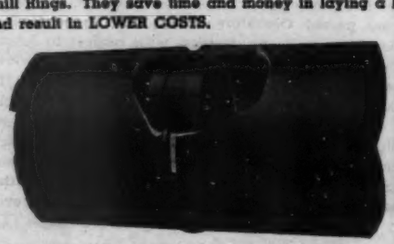

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California Field Report

By
L. P. STOCKMAN

Fate of Atkinson Bill May Influence Field Operations

LOS ANGELES, Calif., Oct. 23.—The decline in drilling operations in California during the past 30 days is due to the usual depletion of drilling budgets plus uncertainty that exists regarding the Atkinson oil-control measure that will be voted on by the general electorate on November 7, and the fact that a number of California operators have purchased considerable equipment in order to take advantage of a possibility that steel prices will reach higher levels next year. In many cases these purchases came out of the drilling budget. As far as the Atkinson oil-control bill is concerned it would appear that operation of the measure in the hands of Richard Sachse, the new appointee as director of natural resources, will be capably enforced if the vote favors the bill.

Wilmington

Completion of six new wells in the Wilmington field added a total of 3,053 bbl. of new production this week under severe curtailment. Long Beach Oil Development Co., operating tideland deposits for the Long Beach Harbor Department, completed No. 4-W, flowing 290 bbl. of 26.7-gravity oil and 200,000 cu. ft. of gas per day through a 17/64-in. bean from the Terminal zone at 4,027 ft.

On Lease Y, Long Beach Oil Development Co. completed No. 10-Y flowing 385 bbl. of 22.9-gravity oil and 425,000 cu. ft. of gas per day through an 18/64-in. bean from a depth of 3,917 ft. No. 11-Y was completed flowing 351 bbl. of clean 29.3-gravity oil and 360,000 cu. ft. of gas daily through an 18/64-in. bean from the lower Terminal zone at 4,037 ft.

Additional Completions

Earlier in the week, Long Beach Oil Development Co. completed No. 12-Y flowing 282 bbl. of clean 28.3-gravity oil and 380,000 cu. ft. of gas per day through an 18/64-in. bean from 3,987 ft. Brookline Oil Co. completed No. 4 Harbor pumping 485 bbl. of 15.3-gravity oil cutting 3 per cent from the Ranger zone at 3,698 ft. This well was carried down to the depth at which the Ford zone should have been reached, but the interval was barren and the hole was plugged back from 5,760 ft.

No. 22-A L.B.H.D. of Hancock Oil Co. registered the largest initial production, flowing 1,260 bbl. of 24.3-gravity oil and 400,000 cu. ft. of gas per day through a 48/64-in. bean from the Terminal zone with bottom of the hole at 4,057 ft. Present indications point to a continuance of drilling in the Wilmington field for several months, although the scope of work will be somewhat restricted as the period of competitive drilling has passed. Operators in the Long Beach Harbor section have made no decision with respect to future development of the Ford zone and it will be several months before this zone becomes important. Due to block faulting, which divides the Wilmington field into five separate segments, it is possible to retard development of the Ford zone in the Long Beach Harbor section, while operators in another segment proceed with development of the same zone as the faults adequately seal each segment and prevent movement through the faults.

Montebello

Six new wells and one recompletion were recorded in the Montebello extension. Current completions are the result of wells started more than a month ago and there still remain about 38 wells to be finished based on present drilling. Some additional wells are being started. Kern Oil Co. finished the recompletion when No. 24 Monterey was completed flowing 996 bbl. of 35.9-gravity oil cutting 2 per cent and 2,220,000 cu. ft. of gas per day through two 1¼-in. beans from La Merced zone with bottom at 7,600 ft. This well, a former upper-zone producer at 5,781 ft., was redrilled and deepened to La Merced zone.

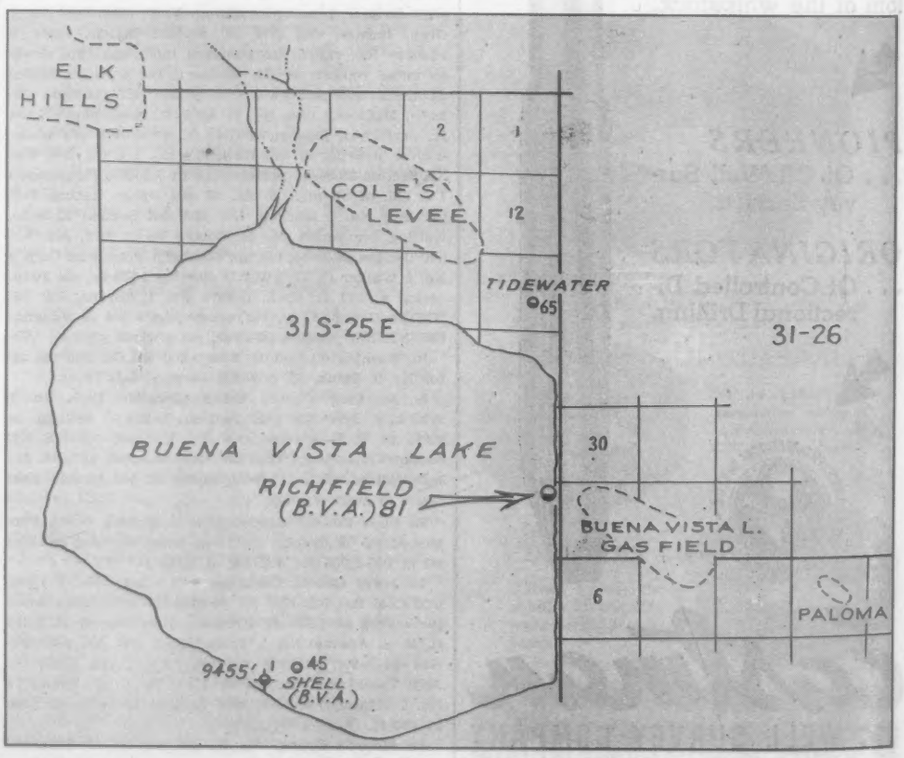
British American Oil Producing Co. completed 2 new wells and both showed good production. These two new wells which are located on property subleased from Union Oil Co. were Nos. 1 and 2 on the Howard & Smith property. No. 1 Howard was brought in flowing 430 bbl. of relatively clean 35.8-gravity oil and 950,000 cu. ft. of gas per day through a 32/64-in. bean from La Merced zone with bottom of the hole at 7,634 ft. No. 2 Howard & Smith of British American Oil Producing Co. was brought in flowing 540 bbl. of 36.1-gravity oil and 1,000,000 cu. ft. of gas per day through a 34/64-in. bean from La Merced zone at 7,635 ft.

Fullerton Oil Co. completed another good well on the Trustee lease in the eastern end of the Montebello field when No. 2 Trustee was brought in flowing 1,030 bbl. of 35.6-gravity oil cutting 2 per cent and 1,900,000 cu. ft. of gas daily through a 1-in. bean from La Merced zone with bottom of the hole at 7,605 ft. No. 2 Trustee was finished with a 7-in. water string cemented at 7,519 ft. and the well brought in flowing barefoot as no liner was run in the hole. East Montebello Oil Co. also completed an excellent well when No. 1 Rissinger flowed 1,240 bbl. of 36.2-gravity oil per day through open line from La Merced zone at 7,621 ft. Gas production totaled 2,100,000 cu. ft. daily and while this and other wells were completed this week through open line or large beans this practice is changed shortly after completion.

Sunset Oil Co. completed No 1 Howell flowing 710 bbl. of 35.9-gravity oil and 1,900,000 cu. ft. of gas per day from La Merced zone at 7,660 ft. No. 1 Lehman of York Oil Co. has been completed flowing 580 bbl. of 36.6-gravity oil and 1,100,000 cu. ft. of gas per day from La Merced zone with bottom of the hole at 7,660 ft. Several additional wells are scheduled for completion in the Montebello field within the next few days. These projected completions include No. 1 Schnakenburg of Albertson-Boswell Oil Co.; No. 2 Scott-Arnold of Fullerton Oil Co.; No. 2 Coffman of Graham-Loftus Oil Corp.; No. 36 Monterey of Mabee Oil Co., drilling on property originally held by Kern Oil Co.; No. 1 Reservoir of Montebello Reservoir Oil Co.; No. 10 Howard & Smith, No. 7 Paul Howard, No. 5 Wilcox, and No. 7 Wilcox of Union Oil Co., as well as No. 1 Extension of United Montebello Oil Co. Texas Co. has logged what appears to be the top of La Merced zone in No. 1 Wilcox in the western end of the Montebello field at 7,490 ft. and if this well shows large production it will extend the productive limits in the west end about 300 ft.

Long Beach

The Long Beach field may come back into the limelight in the near future if present deep drilling proves successful. Dormax Oil Co. has logged a good-looking oil sand in its No. 1 and at 10,157 ft. preparations are under way to run in a water string. This well is north of the initial deep test drilled more than a year ago by De Soto Oil Co. and the oil sand cored looks far more promising. This deep drilling is an important factor because if one of these deep wells shows substantial production it will be almost impossible to stop the rush to drill that would ensue, in which case many



Richfield Oil Corp. is drilling a wildcat at the east end of Buena Vista Lake in Kern County, California, and may possibly find a new oil field northwest of Buena Vista Lake gas field as the recent find of Western Gulf Oil Co. and Texas Co. at Paloma indicates a structural trend in that direction

of these town-lot holdings may be grouped in order to provide sufficient acreage to keep a well within the confines of a lease. Even a minor drift from the vertical in a 10,000-ft. well will carry the bit beyond property lines and thus it is important to have sufficient amount of acreage to permit a minor drift.

From a geological standpoint as well as from a structural point of view there is no reason why deeper production should not be developed in the Long Beach field. Previous to completion of the deep well of De Soto Oil Co., which is still producing commercially, the only deep well drilled in the field was No. 11 Nesa of Shell Oil Co., Inc., several years ago, which was later abandoned as unproductive at 9,280 ft. No. 11 Nesa found an oil sand but it could not be produced. The De Soto zone, which is being prospected by De Soto Oil Co. and Dormax Oil Co., is still in the Miocene and at 10,000 ft. there is a possibility that additional productive zones might be expected with deeper drilling. During the current week Hilldon Oil Co. recompleted No. 3 Amebco pumping 105 bbl. of 24.3-gravity oil per day after the hole had been redrilled and deepened from 4,238 ft. to 5,290 ft. This deepening job carried the well from the Pliocene into the Miocene. This well, out in the northwest extension, was finished with a 9-in. water string cemented at 4,150 ft. and 1,300 ft. of blank liner cemented at 5,250 ft. A short 5-in. liner was landed at 5,288 ft. and carried perforations at 5,249-88 ft. Italo Petroleum Corp. has recompleted No. 3 Lightburn in this field pumping 65 bbl. of clean 25.5-gravity oil per day after the hole had been plugged back from 5,040 ft. and then redrilled to 3,168 ft. and finished in the upper zone. The pipe record shows a 7-in. water string cemented at 3,090 ft. and a 5½-in. liner landed at 3,168 ft. and perforated at 3,090-3,168 ft.

Dominguez

Union Oil Co. has staked location for a first-line offset to the Gardena Syndicate parcel in the extreme western end of the Dominguez field of Los Angeles Basin and while rig material is not yet on ground actual work should get under way shortly. This is the first of two wells to be drilled on the Callender lease which adjoins the Gardena parcel on the east, the object being to complete offsets before any drilling is undertaken on the Gardena Syndicate acreage. This parcel was at last reports still unleased due to the exorbitant royalty asked by officials of the Gardena Syndicate. No cash bonus is asked but the landowners want a royalty of 50 per cent with some allowable deductions. It is generally admitted that a part of the Gardena parcel should be productive as the Miocene is definitely rising to the west. Union Oil Co. completed No. 71 Callender in the west end of the Dominguez field, flowing 1,655 bbl. of 31.3-gravity oil and 2,000,000 cu. ft. of gas per day through a 42/64-in. bean from a depth of 7,485 ft. Tubing pressure is 470 lb. and casing pressure is 500 lb. This is the most northwesterly well in the field and proves up several additional locations to the west. Shell Oil Co. recompleted No. 9 Reyes and returned it to production pumping 345 bbl. of 27.6-gravity oil cutting 20 per cent. It had been deepened from 4,210 ft. to 4,230 ft. was finished with a 4¾-in. liner landed on bottom and perforated at 3,863-3,939 ft. and 3,999-4,230 ft. Completion of No. 71 Callender and No. 9 Reyes leaves only one string of tools in operation in the Dominguez

(Continued on Page 178)

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Intercoastal-domestic—						
Crude oil	.....	.....	.....	.....	771,206	852,826
Fuel oil	.....	.....	74,080	10,583	1,819,073	.....
Diesel and gas oil	.....	.....	.....	.....	163,501	.....
Gasoline	.....	.....	97,191	13,899	2,718,404	2,437,678
Kerosene	.....	.....	.....	.....	194,850	257,005
Foreign exports—						
Crude oil	154,328	22,047	58,474	8,353	11,841,497	17,342,604
Fuel oil	108,697	15,528	217,810	31,116	7,269,369	7,131,884
Diesel and gas oil	68,101	9,729	94,373	13,482	6,959,582	4,882,907
Gasoline	86,214	12,316	.....	.....	6,102,765	6,344,434
Kerosene	17,388	2,484	.....	.....	1,313,089	852,313
Lubricants	.....	.....	.....	.....	127,367	173,388
Coastwise-domestic—						
Crude oil	98,780	12,683	306,197	43,742	10,013,709	9,695,305
Fuel oil	410,890	58,699	409,080	58,440	8,347,494	9,392,510
Diesel and gas oil	55,192	7,885	50,212	7,173	1,828,056	1,228,148
Gasoline	366,080	52,297	429,165	61,309	13,382,982	11,888,427
Kerosene	42,091	6,013	18,744	2,678	426,859	208,566

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic—						
Fuel oil	.....	.....	.....	.....	124,055	.....
Diesel and gas oil	.....	.....	.....	.....	69,550	196,644
Gasoline	43,235	6,176	.....	.....	43,235	25,409
Kerosene	31,553	4,508	.....	.....	100,507	16,124
Asphalt	.....	.....	.....	.....	425,845	490,039
Lubricants	.....	.....	.....	.....	24,870	16,905
Foreign exports—						
Crude oil	87,669	12,524	.....	.....	4,405,259	4,588,646
Fuel oil	.....	.....	.....	.....	2,308,756	2,210,195
Diesel and gas oil	.....	.....	.....	.....	2,134,716	2,319,581
Gasoline	231,845	33,121	.....	.....	2,749,592	4,536,916
Kerosene	127,475	18,211	.....	.....	531,717	696,099
Asphalt	.....	.....	.....	.....	14,151	56,258
Lubricants	20,888	2,984	.....	.....	466,877	424,152
Other finished oil	.....	.....	.....	.....	469	.....
Coastwise-domestic—						
Fuel oil	180,212	25,745	64,711	9,244	5,306,640	4,807,946
Diesel and gas oil	36,947	5,278	14,076	2,011	1,041,450	1,237,067
Gasoline	170,369	24,338	98,478	14,068	6,515,238	6,269,118
Kerosene	30,151	4,307	30,212	4,316	731,667	449,786

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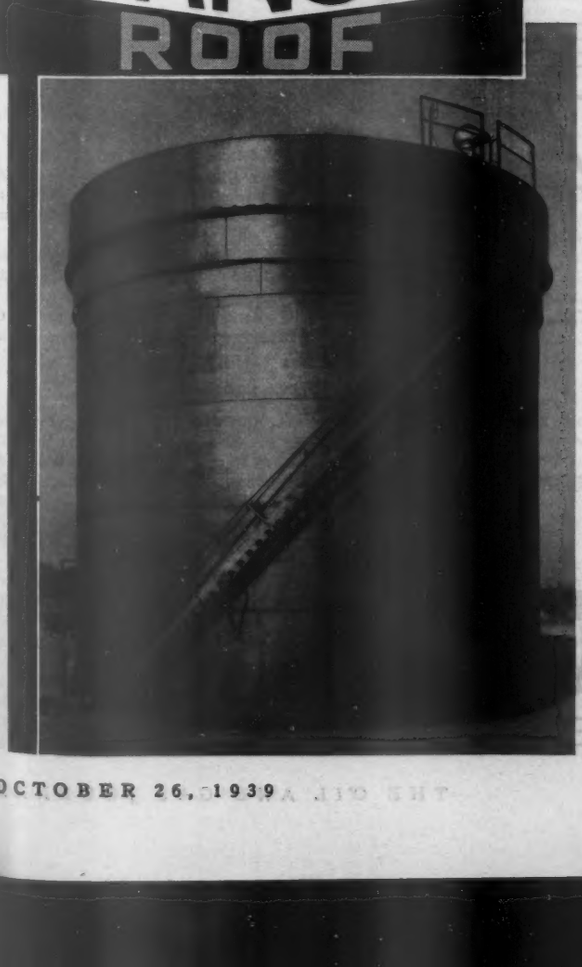

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Start Interesting Deep Test on Laurel Ridge Anticline

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Oct. 23.—An interesting deep test is starting in Southwest Pennsylvania on the Laurel Ridge anticline, or the next large structure east of the present gas production on Chestnut Ridge. In Stewart Township, Fayette County, New Penn Development Co., William E. Snee and E. G. Mueller are building a rig on the Gregg L. Neel farm, 0.95 mile northeast of Maple Summit School and 0.85 mile west of the Westmoreland-Fayette county line. The surface elevation is 2,566 ft., and the lower Devonian may be expected at 7,500 ft. The contractors are Fairman Brothers.

In West Virginia a wildcat that is scheduled for the Oriskany sand is starting on the west flank of the Parkersburg syncline. In Steel district, Wood County, United Carbon Co. has started drilling on the J. K. Grimm and others' (Morris) farm, 1½ miles north, 64° west, of the town of Saulsbury and west of the corner of Tygart, Slate and Steel districts. The surface elevation is 750 ft.

During the week in the lower eastern fields 26 operations were reported, of which 8 were dry, 13 gas wells, and 5 producers with a daily initial of 50 bbl. One deep test in West Virginia was dry and one in Southeast Ohio.

SOUTHEAST OHIO

In Mahoning County, Southeast Ohio, Tri-State Gas Co.'s test on the T. W. Baird farm, northeast corner of Poland Township, is shut down in the Oriskany after a showing of gas in the top of the sand was drowned out by salt water. Top of the Onondaga was placed at 3,820 ft.; Oriskany, 4,021 ft.; and there was an estimated showing of 100,000 cu. ft. of gas a short distance in the sand. It may be deepened from 4,036 ft.

In Athens County Ross, Weimer & Ross drilled on the Wayne Wingett farm in Section 13, Lodi Township, through the Mitchell sand to 540 ft., and it was dry.

In Knox County Steri C. Brown and others completed a second test on the Clutter Burras farm in Section 12, Clay Township, in the Big lime (eastern Onondaga) at 2,140 ft., gauging 537,000 cu. ft.

In Medina County Oko Oil & Gas Co. drilled No. 35 T. W. Brinker, Tract 14, Chatham Township, through the Berea grit to 388 ft., and it was dry. In Section 13, Chatham Township, Marine Trust Co. drilled No. 027 W. H. Ripley through the Berea grit to 515 ft. There was no sand, and it will be used for an intake well.

In Perry County Davis & Hazlett completed a test on the J. H. E. Penrod farm, NW¼ Section 21, Monroe Township, in the Clinton sand at 3,697 ft. This sand was dry, but there was a showing of 3 bbl. in the Berea.

In Washington County Lone Pine Oil & Gas Co. completed No. 3 Homer Burkhart at Neff Ridge, Section 4, Liberty Township, in the Berea grit at 1,896 ft. It gages 23,000 cu. ft. with a quarter barrel of oil.

SOUTHWEST PENNSYLVANIA

Two small producers were completed in Southwest Pennsylvania. In Washington County Union Gasoline & Oil Corp. completed No. 823 C. T. Conn in South Franklin Township at 1,043 ft., with about 4 bbl. at 984-90 ft. Harry Williams & Co. completed No. 4 Jason Buchanan at 979 ft., with the Little Dunkard sand at 924 ft. and about 6 bbl. at 956-66 ft.

Armstrong County

In Cowanshannock Township, Armstrong County, T. W. Phillips Gas & Oil Co. has started drilling on the W. M. Harkleroad farm. Louden Drilling Co. is rigging up to deepen the A. G. Schaeffer test. In Kitanning Township Judson and others have started drilling No. 2 W. J. Gray. In South Bend Township Shelocta Oil & Gas Co. is rigging up the Harve Reefer test. In Plum Creek Township William Collins is starting to spud No. 1 Add Reefer.

Clarion-Indiana-Westmoreland

In Clarion County Burnham Gas Co. completed the test on the Charlotte Slater farm in Clarion Township at 2,849 ft., gaging about 40,000 cu. ft. from the Murraysville, Hundred Foot, and Speechley.

In Piney Township, Clarion County, T. W. Phillips Gas & Oil Co. completed the test on the John Rankin farm, gaging 320,000 cu. ft. from the Hundred Foot and Murraysville. In Red Bank Township Owens Illinois Glass Co. has rig up for No. 1 Lewis Keck.

In Indiana County T. W. Phillips Gas & Oil Co. completed No. 1 Joseph Mack in White Township at 3,621 ft., gaging 55,000 cu. ft. from the Murraysville, Hundred Foot, and Bradford sands.

In Westmoreland County Kiski Valley Gas Co. has a location on the James McBriar farm.

Fayette-Greene

In Nicholson Township Greensboro Gas Co. is rigging up the Mary Oravis test.

In Greene Township, Greene County, Brummage and others completed a test on the H. Durr farm at 3,245 ft. with the Elizabeth sand at 3,215-28 ft. and a gage of 116,000 cu. ft. at 3,220 ft.

Washington County

In Amwell Township, Washington County, Shivers and others are drilling at 1,300 ft. on the T. J. Horn farm with the Little Dunkard at 1,041-80 ft.; about 25,000 cu. ft. of gas at 1,071-76 ft.

In Bethlehem Township Union Gasoline & Oil Corp. has rig standing for No. 824 H. A. Day.

In Allegheny County D. A. McKnight drilled the test on the John H. Flick farm in West Deer Township through the Third sand to 1,826 ft. and it was dry. In South Fayette Township Homer Nixon and others are rigging up the Joseph Hickman test.

Deep Tests

In Armstrong County Peoples Natural Gas Co., deepening the Lowry Martin test on the Greendale anticline in Wayne Township, struck a gas pocket in the Helderberg at 6,889 ft., blowing the tools up the hole and sticking them. The line has been cut and the tools are being fished. In Butler County South Penn Oil Co. has started deepening the test on the M. A. Fowler heirs in Concord Township another 100 ft. in the Helderberg.

On Chestnut Ridge in Fayette County New Penn Development Co., William E. Snee and others are drilling up a bailer lost at 6,120 ft. on the Piedmont Coal Co. lease in North Union Township. They are drilling at 1,964 ft. on the Humberson farm in Garrett County, Maryland.

WEST VIRGINIA

Three producers were completed in West Virginia. In Calhoun County V. W. Hamilton and others completed the second test on the T. S. Cunningham farm in Sherman district at 2,264 ft., the Injun sand, good for 10 bbl. a day.

In Ritchie County West Virginia Investment Co. completed the test on the Arthur Amick farm in Grant district at 1,902 ft., Squaw sand, showing for 25 bbl.

In Roane County Bonnett Oil & Gas Co. completed No. 1 W. R. Haines in Harper district at 1,486 ft. good for 6 bbl. a day along with about 100,000 cu. ft. of gas.

Gas Wells

In Braxton County Pittsburgh and West Virginia Gas Co. completed No. 7702 R. F. Stalnaker in Birch district at 1,944 ft., gaging 700,000 cu. ft.

In Calhoun County McCall Drilling Co. completed the test on the W. E. and S. L. Stump farm in Sherman district at 2,157 ft., a light gas well and abandoned.

In Lincoln County Big Laurel Gas Co. completed deepening No. 1 Callaway Plumley in Union district at 3,532 ft. starting with 200,000 cu. ft. of gas, 18 hours after shot.

In Roane County Morley Oil & Gas Co. completed the second test on the James White farm in Geary district at 1,001 ft., gaging 236,000 cu. ft. without shot.

In Wirt County Glenn Roberts drilled on the W. G. Monroe farm in Burning Springs district through the Injun sand to 2,180 ft. and it was dry.

Oriskany Gas Field

In Poca district, Kanawha County, United Fuel Gas Co. is completing No. 4853 W. H. O'Dell with the Oriskany topped at 4,925 ft. and a gage of 6,981,000 cu. ft. at 4,963 ft. This company is drilling at 1,115 ft. in the Mattie J. Krantz test, Malden district; at 1,653 ft. in the C. H. Sisson test, Poca district; at 221 ft. in the C. C. Fisher test, and shut down at 5,050 ft. in the D. C. Ingram test.

In Poca district Godfrey L. Cabot, Inc., completed the test on the Poca Coal Land Co. at 2,134 ft. with Big lime topped at 1,998 ft. and a final gage of 3,330,000 cu. ft. This operator is drilling at 292 ft. in the Mansfield Jones test in Union district.

In Elk district Columbian Carbon Co. completed the test on the Lelia Hanna farm at 4,855 ft. with the Oriskany sand topped at 4,781 ft. and a gage of 3,250,000 cu. ft., cleaning out. In this district this company

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is drilling at 4,963 ft. in the Tignor and Jordan test.

In Poca district Brawley Reid Gas Co. is completing the test on the A. L. Campbell farm with the Oriskany topped at 5,018 ft. and a gage of 103,000 ft. at 5,068 ft. This company is down 2,200 ft. in the Clate Fisher test.

In Poca district Columbian Carbon Co. topped the Corniferous lime at 4,960 ft. in the Tignor and Griffith test; drilling at 4,978 ft. in No. 1 H. H. Parsons, and at 2,460 ft. in No. 2; at 1,395 ft. in the John Price test; at 400 ft. in the B. H. Richards and others test. Glenn Oil & Gas Co. topped the Corniferous lime at 5,182 ft. in the Laura Flowers test; Alpha Gas Co. is drilling at 1,525 ft. in No. 2 J. W. Legg; West Virginia Gas Co. at 1,327 ft. in the P. B. Garnes test; United Carbon Co. at 2,235 ft. in the E. P. Higginbotham test.

In Poca district Godfrey L. Cabot, Inc., has a location for No. 4 Putnam Co., elevation 970.5 ft., and in Union district a test on the L. M. Lafollette, elevation 704 ft.

Outside Deep Tests

In Jackson County the test of Joe Rubin and others on the Gilbert Starr farm in Ravenswood district, was drilled to 4,728 ft. and dry. The Corniferous lime was topped at 4,590 ft. with only a small showing of sand before the Helderberg was reached at 4,723 ft. As this test is east of the discovery well on the W. J. Brown farm on the Ohio River the absence of Oriskany sand presents a problem as there was a thickness of at least 13 ft. westward.

In Ripley district, Jackson County, the test of the Columbian Carbon Co. on the John F. Parsons farm was shot after it proved a fair gas well in the Oriskany sand but shut in for the present.

Indiana Fields

(Continued from Page 146)

Donation 214, Township 5n-9w, hole full of water at 1,940 ft., drilling at 2,080 ft. J. S. Young and others' No. 1 Mabes, NW NW NW Section 27-5n-8w, drilling at 470 ft. Hart and Williams' No. 1 Hart, C NE SW Section 28-5n-7w, abandoned location.

In Sullivan County A. S. Reed and others' No. 2 Huff, C S½ SW NE Section 35-8n-10w, completed for 920,000 cu. ft. of gas at 790-96 ft. Siosi and others' No. 1 Pardee, NE NE SE Section 18-8n-10w, small showing of oil at 672 ft., salt water at 677 ft., filled up 400 ft. in 1 hour, shut down at 708 ft. for repairs. Niagaran Oil Co.'s No. 6 Riley, NW NE NW Section 33-8n-10w, drilling at 222 ft. Salem Oil Co.'s No. 1 Woodward, NW NW NW Section 7-8n-9w, shut down at 1,700 ft. Niagaran Oil Co.'s No. 1 Knowles, SE SE NW Section 6-8n-9w, location for a Niagara lime test.

In Vigo County Siosi's No. 1 D. Stufflebean, C N½ NW SE Section 16-10n-10w, drilling at 175 ft. Ben H. Nation and others' No. 1 Boyce, SE SE SW Section 33-11n-9w, location. John Seip and others' No. 1 Williams, SW SW NE Section 24-13n-2w, location.

In Warrick County Hoosier Drilling Co.'s No. 1 Baum, SW SE NW Section 9-6s-7w, drilling at 1,600 ft. Fred McWilliams' No. 1 Edwards, NW SE SE Section 24-5s-9w, shut down at 1,700 ft.

In Vanderburg County Illinois Oil Co. and others set 10-in. casing at 86 ft. in No. 1 Keck, 2,890 ft. from west and 2,310 ft. from south lines of Section 6-7s-11w. J. L. Drake's No. 1 Keif, NW cor. Section 5-6s-10w, Mansfield sand at 1,065 ft., total depth 1,100 ft., hole full of water and abandoned. Sun Oil Co.'s No. 1 Kloke, SW SW SW Section 6-7s-11w, dry and abandoned at 1,895 ft. K. R. Bixby's No. 14 Glaser, SE cor. SW SW NW Section 31-5s-11w, shot with 160 qt. at 1,175-1,222 ft.; will run 6-in. casing.

In Perry County Persise and Wyman were fishing for tools at 800 ft. in No. 1 Greiner, SW SE SE Section 13-4s-2w. D. & H. Drilling Co.'s No. 1 Sipp, SE NW SE Section 24-3s-9w, shut down for orders at 969 ft. after coring from 935 ft.; at 957-69 ft. recovered 2 ft. of saturated sand, 3 ft. of shaly sand, 5 ft. of white sand, and 2 ft. of lime.

In Lagrange County J. W. Hunt is drilling No. 1 Babcock, SW SW NE Section 13-37n-9e, no depth available. In Cass County Fred Eastman and others' No. 1 Kistler, NE SE SE Section 11-28n-1w, drilling at 500 ft.

In Huntington County Claude Drilling Co.'s No. 2 Young, SE SE SW Section 21-26-9e, flowed 22 bbl. of oil and 50 bbl. of water naturally, but after a 70-qt. shot at 1,017-37 ft., produced 4 bbl. of oil and 50 bbl. of water; not completed. R. L. Myers' No. 1 Cramer, E½ SW NW Section 29-26n-9e, shut down at 1,120 ft.; had a small showing of oil at 1,011 ft.

In Henry County G. W. Sweigert made a location for No. 2 fee, NE cor. NW NW Section 23-17n-9e. Russell Riggs made a location for No. 1 fee, SW cor. NW SW Section 6-17n-9e.

In Decatur County Hoosier Public Utilities' No. 204 Ben Harping, C NE NW Section 14-9n-9e, completed for 189,000 cu. ft. of gas at a total depth of 952 ft. Hoosier Public Utilities' No. 205 Schoettmer, C SW NE Section 14-9n-9e, location.

In Martin County Norris & Gilmore's No. 1 Cramer, SE NW SE Section 3-2n-4w, was drilling at 510 ft.

In Daviess County Ruble's No. 1 Huff, NW SE NW Section 9-2n-5w, drilling by tools lost at 550 ft. Newton Pipe Line Co.'s No. 1 Hiatt, NE NE SE Section 36-4n-5w, machine.

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Chicago, Ill.

Rocky Mountain Area

80 Bbl. in 1 Hour From Well in Joss Sand in Lance Creek

By
T. R. INGRAM

DENVER, Colo., Oct. 23. — The Joss sand on the north side of the Lance Creek field in Wyoming proved to be a good producer in the Argo Oil Co.'s No. 7 Ford, and flowed 80 bbl. an hour. The Continental Oil Co.'s No. 7 Rodeo-4, on the east side, pumped 250 bbl. per day from the Sundance. There was one new operation. The Gaylord-McConnel test in Big Hollow was dry and abandoned, and Martin & Gaylord's No. 1 Horne Brothers, in Carbon County, a wildcat, gaged 7,300,000 cu. ft. of gas in the Muddy. Texas Co.'s No. 2-F, in La Barge field, was an average well.

Colorado's deep test on the El Dorado structure in Boulder County, the Continental Oil Co.'s No. 1 Borra, was abandoned at 6,381 ft. after going through the Hygiene.

In Montana Valentine M. Kirk's test on the north flank of the Dry Creek structure in Carbon County, was dry and abandoned. Cut Bank had one completion and one new operation, and Kevin-Sunburst had one gas well, and a small producer, both on the east side, and two new operations. The Dan Drumheller wildcat in Meagher County was completed for 15,000 bbl. of water and will be used for irrigation.

NEW MEXICO

Interest in the Southeast New Mexico district centered for another week on Farley's No. 1 Texas Co.-State, new pool opener in the western part of Lea County. Testing continued as the week closed and operators estimated the well capable of 1,500 bbl. of oil daily. Last gage showed a recovery of 1,000 bbl. in 18 hours of swabbing through 7-in. casing set at 2,593 ft. Production covered a period of 23½ hours, but the well was shut down for 5½ hours of the time. The first 13 hours of swabbing netted 57 bbl. of 28.6 gravity oil hourly. Only 2 ft. of pay, 2,627-29 ft., was drilled in the discovery. The operators have elected to complete the test without the aid of acid or nitroglycerin. Location is in the C NE SW Section 16-20s-32e, 13 miles west and 2½ miles north of the Lynch pool. Several of the new locations staked in the area last week have either spudded or are preparing to spud early this week.

General field activity in the district showed a slight decline over the previous week, only 12 new locations having been staked in Lea County and 3 in Eddy County. The Vacuum pool in Lea County received most of the activity, Magnolia Petroleum Co. having staked Nos. 46, 47 and 48 State-Bridges, Humble Oil & Refining Co. starting No. 11-K State and Ohio Oil Co. its No. 11 State-McDonald.

Indicating a new oil pool for Eddy County, H. B. Nolan's No. 1-X Iles, northwest of the Grayburg-Jackson pool, was shut in for storage. Electrical survey showed pay sand from 1,800 to 1,820 ft., total depth, and the well was shot with 60 qt. It was cleaned to bottom and swabbed 8 bbl. hourly. Highest fluid level was reported at 1,400 ft. It is in the SE cor. Section 17-16s-29e.

Magnolia Petroleum Co. entered Lea County last week as a crude buyer and posted a schedule retroactive to October 15. The company recently completed a gathering system in the Vacuum field from which point the crude will be delivered to the Texas-New Mexico Pipe Line Co. for transportation in its trunk line. Magnolia does not have a main line in the area.

Eddy County

Carper Drlg. Co.'s No. 4 Robinson, SE SE SW Sec. 25-16-31. T.D. 4,025 ft.; tstg.
G. R. Burke's No. 1 State, NE NE NW Sec. 36-16-24. Drlg. 1,572 ft.
B. H. Nolem's No. 1 Iles, SE SE SE Sec. 17-16-29. Tstg. 1,803-19 ft.; est. 35 B.O.P.D.; S.I. for storage.
Artesia Drlg. Co.'s No. 1 Hoffman, SE SE SE Sec. 14-17-24. S.D.R. 423 ft.
J. R. Cones et al's No. 1 Saunders, SE SE NW Sec. 13-17-27. S.O. 505 ft.; S.D.O. 600 ft.
Danciger O. & R. Co.'s No. 5-A Turner, C N½ NW NW Sec. 19-17-31. S.O.&G. 3,409-15 ft.; tstg.
J. E. Hughes' No. 3 Brooks, NE NW NW Sec. 19-17-28. S.D.O. 2,222 ft.
Plains Prod.'s No. 1 Daugherty, SE SE SE Sec. 11-17-27. T.D. 428 ft.; S.D.O.
Republic Prod.'s No. 3-B Robison, SE SE SE Sec. 35-17-29. S.S.O. 3,165 ft.; shot with 40 qt.; est. 4 B.O. P.D.; tstg.
Plains Prod. Co.'s No. 1 Massie, C SW SW Sec. 27-18-29. S.D.R. 2,095 ft.; S.O. 2,075-83 ft.
Barney Cockburn's No. 1 Graham-State, C NE NE Sec. 16-18-31. Drk.
L. E. Elliott's No. 1 Elliott, SE SE SE Sec. 24-18-29. S.S.O. 3,255-75 ft.; drlg. 3,597 ft.
Franklin Pet. Corp.'s No. 1 Masteller, NW NW NE Sec. 7-18-30. Loc.
Franklin Pet. Corp.'s No. 1 Cappedge, NW SW NW Sec. 5-18-30. S.D.O. 3,092 ft.
E. S. McAuliff's No. 1 Coates, C SE NE Sec. 3-18-23. S.D. 1,079 ft.
Me-Tex et al's No. 1-B Ballard, C NW NW Sec. 8-18-29. T.D. 3,017 ft.; P.B. 2,635 ft.; est. 30 B.O.P.D. while C.O.; tstg.
Saunders Bros.' No. 1 Murdock, NW NW SW Sec. 1-18-29. T.D. 2,625 ft.; F. est. 100 B.O.P.D.; flwd. 26 B.O. in 40 min. then went dead; tstg.
Fred Turner's No. 1 Nickson, C NE NE Sec. 30-18-26. S.D.O. 2,150 ft.
Underwood & Sanders' No. 2 Miller, SW NW NW Sec. 4-18-29. T.D. 2,405 ft.; milling csg. 1,800 ft.; jnkd. hole; skidded 50 ft. east; S.D.R. 1,660 ft.
J. W. Elliott's No. 1 Cannon (O.W.D.D.), C SW SE Sec. 4-19-30. S.D. 2,355 ft.
Trojan Oil Co.'s No. 1 Grant, SW SW NE Sec. 33-20s-25e. S.O. 1,530 ft.; S.D.R. 1,580 ft.

Chaves County

G. H. Cowden's No. 1 Brunson, 330 ft. N and W lines, Sec. 27-9s-30e. C.&P.
R. M. Baker's No. 1 Baker, NW NW NW Sec. 10-19-30. R.U. and S.D.
Caudill & French's No. 1-A Smith (O.W.D.D.), Sec. 1-4-29. Prep. to cmt. off csg. from 3,336-70 ft.; drlg. by csg. 3,697 ft.
E. J. Fisher's No. 1 Hill, CSL S½ Sec. 8-15-25. S.D.O. 850 ft.
Nay Hightower's No. 1 Billingslea, C SW NE Sec. 28-11-30. T.D. 3,445 ft.; P.B. 3,430 ft.; S.D.O.
Tarkenton Bros.' No. 1 Peters, SE SE NW Sec. 33-11-25. S.S.O. 1,280-85 ft.; drlg. 1,442 ft.
Western Minerals, Inc., No. 1 Dow, C SW NW Sec. 27-10-30. S.O. 3,920-25 ft.; S.D.R. 4,090 ft.

Dona Ana County

Picacho O. & G. Co.'s No. 1 Armstrong, Sec. 15-23s-1w. S.D. 2,410 ft., T.D.; repairs.
Slack & Mahres' No. 1 Simmons, Sec. 35-22s-5e. S.D. 2,785 ft., T.D.; repairs.

Luna County

O. D. Berry's No. 1 Berry, SE SE SW Sec. 33-22s-10w. S.D.O. 1,000 ft.

Lea County

Coastal Development's No. 1 Caylor, NW NW SE Sec. 6-17-37. T.D. 5,005 ft.; reran 2-in. tbg. to 4,784 ft.; ran 1-in. tbg. inside of 2-in. to 3,339 ft., with 5 flow valves; flwd. 20 B.O. wtr. plus S.S.O. in 4 hrs. by gas lift; P.B. 4,785 ft.; continued tstg.
Frank Farley's No. 1-A State, Sec. 18-21s-30e. Prep. drill plug; sat. 2,629-31 ft.; new pool opener; flwd. 1,000 B.O. in 18 hrs.; est. 1,500 B.O.P.D.
Maljamar O. & G. Co.'s No. 2 Mitchell, SW SE SW Sec. 5-17-32. T.D. 4,498 ft.; P.B. 3,862 ft.; S.I.; P.B. depth 4,003 ft.
Ohio Oil Co.'s No. 1 State-Staplin, C SE NW Sec. 19-17-35. Drlg. 4,726 ft.
Continental Oil Co.'s No. 8 Britt B-15, C W½ NW SE Sec. 15-20-37. Tstg. 3,882 ft.; 73 B.O. in 7 hrs. after acd.; tstg.
Wilson Oil Co.'s No. 1 Shell-State, C NE SW Sec. 7-21-35. T.D. 3,736 ft.; flwd. 51 B.O.P.D. + tstg. 3,736 ft.
Peters & Elder's No. 3 Brunson, SW SW SW Sec. 3-22-37. Flwd. 42 B.O. in 7 hrs.; T.D. 3,742 ft.; tstg.
Skelly Oil Co.'s No. 1 Sherrell, C SW SW Sec. 31-24-37. Drlg. 1,461 ft.
Anderson-Prichard Oil Corp.'s No. 9 Wells, C SW NE Sec. 6-25-37. P.B. 3,394 ft.; acid. with 1,000 gal.; 17 bbl. fluid, 40% wtr. on gas lift; tstg.

SOUTHEAST NEW MEXICO COMPLETIONS

Lea County

In the Vacuum pool Magnolia Petroleum Co.'s No. 43 State-Bridges, 196 bbl. in 12 hours, natural flow, ½-in. choke, lime at 4,535-4,610 ft. Magnolia Petroleum Co.'s No. 44 State-Bridges, 51 bbl. in 5 hours, natural flow, at 4,431-4,640 ft. Magnolia Petroleum Co.'s No. 45 State-Bridges, 51 bbl. in 4 hours, natural flow, 4,470-4,673 ft. Texas Co.'s No. 10-O State, 445 bbl. in 8 hours, natural flow, 4,250-4,710 ft. Phillips Petroleum Co.'s No. 32 Santa Fe, 450 bbl. in 10 hours, natural flow, 4,117-4,588 ft. Ohio Oil Co.'s No. 4 State-Warn, Account No. 2, 135 bbl. in 3 hours, natural flow, 4,215-4,650 ft. In the Lovington pool Amerada Petroleum Corp.'s No. 4-L.A. State, Section 1-17s-36e, flowed 602 bbl. in 14½ hours after 2,000-gal. acid treatment, total depth 4,901 ft. Skelly Oil Co.'s No. 2-Q State, Section 36-16s-36e, 251 bbl. in 24 hours, natural flow, through ½-in. choke on 2-in. tubing, total depth 5,094 ft. in lime.

NORTHWEST NEW MEXICO

San Juan County

The Continental Oil Co.'s No. 97 Rattlesnake, C S½ SW Section 12-29n-19w, Rattlesnake field, pumped 49 bbl. of oil and 89 bbl. of water initially from sand at 796-801 ft.
Continental Oil Co.'s No. 98 Rattlesnake, NE SE SE Sec. 12-29n-19w. Drlg. 135 ft.; 8⅝-in. at 25 ft.; (first report).
Angel Peak Oil Co.'s No. 8 Govt., C NW SW Sec. 13-28n-11w. T.D. 1,420 ft.; R.U. new rig.
Continental Oil Co.'s No. 100 Rattlesnake, NE NW NE Sec. 2-29n-19w. T.D. 3,106 ft.; redrlg. 2,930 ft.

COLORADO

Adams County

Derby Dome O. & G. Co.'s No. 2 Baxter, C SE SW Sec. 2-3s-66w. T.D. 62 ft.; R.U. to res.

Boulder County

The Continental Oil Co.'s No. 1 Borra, SE NE SW Section 5-1s-69w, El Dorado district, was plugged and abandoned at 6,381 ft. after going through the base of the Hygiene formation. No good sand body was found in the Hygiene, which proved to be running lower than the No. 1 Prince well drilled a number of years ago by the Ohio Oil Co. 2 miles to the northeast. Evidently an overthrust from the mountains caused evidence of structure in the Hygiene. Lack of substantial indications of structure on the Dakota, and the fact that the block is composed of numerous ununitized tracts which would have required extensive offsetting should a discovery be made, resulted in the decision not to go to the lower horizons at between 8,000 and 9,000 ft. The test was started under an agreement to go to the Hygiene with option of drilling the Dakota should indications in upper horizons warrant it.

Custer County

Henry Donnelly's No. 1 Hodge, SE NE Sec. 26-21s-69w. Drlg. below 1,000 ft.

El Paso County

F. F. Hintze et al's No. 1 State, CEL SE SE Sec. 16-11s-60w. Cmtd. 20-in. at 48 ft.; W.O.C.

Fremont County

T. E. Maloney's No. 1, SE NW Sec. 34-19s-69w. Drlg. 1,800 ft.
Waterville Oil Co.'s No. 2 Persons, CWL NE NE Sec. 17-19s-69w. S.D. 330 ft.

Larimer County

Continental Oil Co.'s No. 1 Meyer, SW SE SW Sec. 19-8n-68w. T.D. 5,206 ft.; P.B. to 4,686 ft.; shot with 20 qt. at 4,464-4,686 ft.; W.O. pmp. equip.

Las Animas County

Hulme-Johnston-Allison's No. 1 Azar, SE SE NW Sec. 27-34n-58w. Drlg. 2,125 ft.

WYOMING

Albany County

J. L. Gaylord-G. R. McConnell's No. 1 Fuller, NW NE NW Section 7-15n-75w, Big Hollow district, was plugged and abandoned at 1,055 ft. It had water in the Dakota and a show of oil in the Muddy at 868-905 ft. Location is ¼ mile southwest of the discovery, a small well in the Muddy.

Carbon County

Martin & Gaylord's No. 1 Horne Brothers, in the Horne Valley district, is bottomed in the Dakota sand at 990 ft. It gaged 7,300,000 cu. ft. of gas with a pressure of 260 lb. in the Muddy, topped at 750 ft. Location is ⅛ mile southeast of a test drilled by C. E. Cunningham which had 5,000,000 cu. ft. in the Muddy and water in the Sundance.

A new operation is Frank M. Johnston's No. 1 Government, a test in the Separation Flats district.

Natrona County

The General Petroleum Corp.'s No. 1 Government, C NW SE Section 21-35n-77w, discovery well on Cole Creek in 1937, officially gaged 245 bbl. of fluid per day, of which 92 per cent was oil of 33 gravity, on the pump from the Dakota-Lakota at 7,910-8,015 ft. after plugging back from the Sundance and recompleting.

Niobrara County

Lance Creek now has 17 active operations under way, and drilling will continue without interruption during the winter. One new location was reported this week.

The Argo Oil Co.'s No. 7 Ford, NW SE NW Section 33-36n-65w, an outside well on the north end of the field, proved to be a good producer in the Joss sand, a horizon immediately below the Leo. Total depth is 5,560 ft. It gaged 80 bbl. an hour on a 20-hour test from the Joss sand topped at 5,365 ft., where the 7-in. was set. A drill-stem test from the Leo sand at 5,517-34 ft. showed 30 bbl. of oil in 30 minutes. Rotary table elevation is 4,462 ft.

The Continental Oil Co.'s No. 7 Rodeo-4, SW SW NE Section 35-36n-65w, made 250 bbl. per day initially on the pump from the Sundance at 4,260-85 ft. It is a north offset to the Ohio's No. 1 Leo-7, the most easterly Sundance well in the field.

The Argo Oil Co. released a location for its No. 1 Ong, an outside well on the west side and a west offset to the Continental's No. 8 Rohlff.

Sublette County

Texas Co.'s No. 2-F, SE SW SW Section 27-27n-113w. La Barge field, pumped 28 bbl. the first 17 hours at 953 ft., total depth. It is a completion.

California Co.'s Pinedale test stopped at an even 10,000 ft. to run a Schlumberger test and is now running the 7-in. casing to set at 8,550 ft.

Weston County

Hunter & Saterlee's No. 1 Draper, NW cor. Section 10-46n-63w, was abandoned at 200 ft.

Federal Oil Co.'s No. 10, CNL NE SE Section 15-36n-64w, lost the hole at around 1,000 ft., and skidded rig for No. 10-S.

MONTANA

Carbon County

Valentine M. Kirk and others' No. 1 Robinson, SW SW NW Section 2-7s-21e, on the north flank of the Dry Creek field, was plugged and abandoned at 5,560 ft. after plugging back from 5,828 ft. The Lakota at 5,810-28 ft. carried water. The Dakota at 5,520-60 ft. failed to show anything of value.

Glacier County

Cut Bank had one completion and one new operation. The Glacier Production Co.'s No. 2 Hall, C NE SW Section 35-36n-6w, plugged back from 3,051 ft. to 3,045 ft., and shot sand at 3,014-39 ft. with 30, 40, and 20 qt. and at 3,005-34 ft. with 40 qt. and is cleaning out. This well flowed at 3,044 ft. while drilling in.

Meagher County

Dan Drumheller's No. 1 Moss Agate, SW SE NE Section 25-7n-7e, Moss Agate district, was completed as a water well at 2,170 ft. It had a flow of 15,000 bbl. per day which could not be satisfactorily shut off. Water will be used for irrigation.

Teton County

R. C. Tarrant's No. 1 Hoeschen, NE SE Section 34-27n-5w, in the West Pondera district, was completed in the Madison lime at 2,295-98 ft. and flowed 10 bbl. per day of 31-gravity oil after acidizing with a total of 3,500 gal. Top of the Madison was at 2,283 ft. Wells drilled in that area have had oil shows in the past, but acidization was not then practiced to any extent.

Toole County

In the Kevin-Sunburst field the Montana-Dakota Utilities Co.'s No. 1 Krutsfeld, C SE SW Section 1-33n-1w, was completed in the Sunburst at 1,295-1,325 ft. for 1,900,000 cu. ft. of gas per day with a pressure of 280 lb.

Imperial-Craig's No. 1 Gauss, C SW NE Section 18-35n-1w, pumped 35 bbl. per day naturally in the top of the contact at 1,626 ft. It was then acidized with 500 gal., and is testing.

UTAH

Grand County

Cane Creek Oil Co.'s No. 2 Shaffer, NW SW SW Sec. 31-26s-21e. S.D. 3,225 ft. for repairs; gas blowout; rig damaged.

SOUTH DAKOTA

Harding County

South Dakota State Roy. Co.'s No. 1 State, SW NW Sec. 35-18n-1e. Drlg. 6,012 ft.

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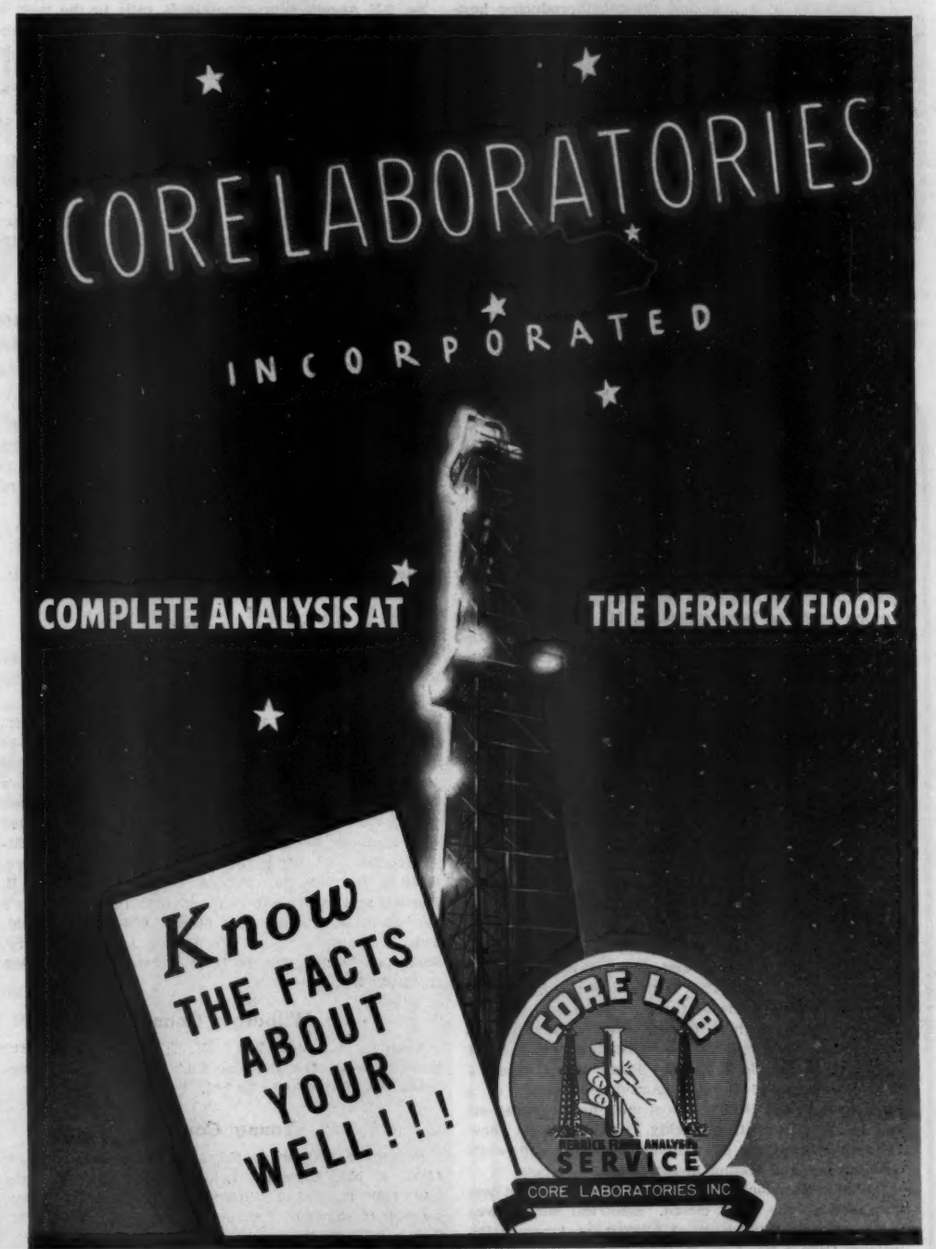

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North and East Texas

By
D. H. STORMONT

Third Pay Horizon Sought in Montague; Strawn Extended

WICHITA FALLS, Tex., Oct. 23.—Continuing its rapid development pace the entire North Texas district passed another active and eventful week, the development being widespread and including Montague, Archer, Wilbarger and Hardeman counties.

Possibility of a new and the third producing horizon in the Rogers & Rogers pool, a mile west of Nocona, and in Montague County, was seen when Rogers & Rogers cemented 7-in. casing for a test of a sand section logged from 4,352 to 4,364 ft. This outpost, between the northeast extension area and the pool proper, encountered the regular sand pay of the pool from 4,329 to 4,334 ft. and in drilling deeper to a total depth of 4,444 ft., found the lower pay. The third horizon is at 4,600 ft. Test is the operator's No. 1 Nocona Cemetery, Jacob Lenow Survey, Abstract 433. No gages were reported from the well.

Also in Montague County, a half-mile-north extension for the 2,900-ft. Strawn-sand pay in the Bonita pool, was indicated at Phillips Petroleum Co.'s No. 1 Custers, northwest corner of James McKnight Survey, Abstract 480. The test was plugged back from 3,895 ft. to 2,895 ft. and shot with 20 qt. from 2,882 to 2,890 ft. After several days of swabbing and cleaning out the well started flowing by heads and was estimated capable of commercial production. It is an east offset to Benton & Holmes' No. 2 Bowers, discovery well in the granite-wash pay section of the pool. The indicated producer was dry in the 3,800-ft. granite-wash section. A mile southeast extension for the pool was indicated at United Producers' No. 1 J. T. West, L. S. Howard Survey, which logged sand, showing oil, at 2,450-55 ft. and 2,939-53 ft. West intended to drill deeper for a test of the granite-wash section. A half-mile-east and slightly north outpost to the pool has been staked, J. M. Holmes and Bob Thomas' No. 1 E. G. Reed, southeast quarter of the J. L. Graham Survey 295. It will test the regular 2,900-ft. pay section and the deeper granite-wash section.

Archer County's deep Caddo-lime pool was given its fourth location during the week when Edwin B. Hopkins staked No. 1 A. Albright, 4,800-ft. test in the SE cor. Section 10, Block 3, H.&T.C. Survey. The discovery well was completed by British American Oil Producing Co. for 888 bbl. of oil daily from Caddo lime at 4,600 ft. The new test is a northwest offset to the discovery.

A new half-mile-west outpost was staked for the Hull-Silk pool of Archer County during the week, L. T. (Bobby) Burns having located his No. 1 H. Wilmot, a 4,400-ft. rotary test in the southeast part of the G. N. Smith Survey and about a half-mile west of his No. 5 Ahrens. This is the first major development on the west side of the pool in several months. The county was given a new 4,500-ft. wildcat test when Waldo P. Stephens and associates located No. 1 Hattie Adae in Block 7, Palo Pinto school lands, 1 mile northwest of Dundee. Activity continues at a rapid pace in the Hull-Silk pool with new completions and locations mounting weekly. Latest reports show 18 active locations, 15 drilling wells and 10 wells cleaning out and testing in this area.

Probable abandonment for North Texas' deepest test was seen as the week closed. Electrical survey was being run to a total depth of 8,258 ft. at Amerada Petroleum Corp.'s No. 1 W. M. Rice, Section 81, Block H, W.&N.W. Survey, in the southeastern part of Hardeman County. It is bottomed in dry Ellenburger lime with only slight shows of oil reported from 8,075 to 8,080 ft. in the basal Pennsylvanian.

One-half-mile northwest extension has been assured for the new 3,750-ft. Strawn-sand pool in eastern Wilbarger County which started out as a west extension area for the K.M.A. pool. Consolidated Oil Co.'s No. 2-CC Waggoner flowed an estimated 70 bbl. of oil the first hour through tubing from 3,751-75 ft. The discovery well in the area was Consolidated Oil Co.'s No. 1-N G. N. Ancell, completed for an estimated 300 to 400 bbl. daily, natural flow. The same company's No. 2-N Ancell, approximately ⅛ mile to the west of the discovery well, topped saturation at 3,751 ft. and after coring to 3,760 ft. in saturation, cemented 7-in. casing at 3,749 ft. for completion.

NORTH TEXAS COMPLETIONS

Archer County

Continental Oil Co.'s No. 2 L. F. Wilson, 4,281-4,312 ft., 1,008 bbl. Bert Ligon's No. 2 O. T. Anderson, abandoned location. Phillips Petroleum Co.'s No. 2 A. L. Moss, 4,302-61 ft., 1,360 bbl. Southern Petroleum Exploration, Inc.'s No. 3 S. D. Johnson, 4,298-4,314 ft., 928 bbl.

Clay County

Griggs and others' No. 1 S. B. Householder, 1,166 ft., dry. M. A. Laning, trustee's No. 1 Moore & Richolt, 1,305 ft., dry.

Cooke County

O. L. Kiel and others' No. 1 Hays School, 1,074 ft., dry. McDaniel & Beechrel's No. 2 Joe Weirsman, 728-32 ft., 69 bbl. in 15 hours. Sinclair Prairie's No. 14 J. M. Best, 4,900-16 ft., 581 bbl. S. S. Staley and others' No. 3 B. Voth, 1,680-96 ft., 306 bbl.

Jack County

Bennett Oil Corp.'s No. 1 S. E. Rankin, 3,127-64 ft., 500 bbl. in 18 hours.

Montague County

Falls & Yeargin's No. 10 Crow, 800-16 ft., 10 bbl.

Wichita County

E.C. Oil Co.'s No. 16 Anna Mangold, 3,765-3,810 ft., 576 bbl. E. D. Egger's No. 5 D. R. Preston, 3,951-64 ft., 512 bbl. Hanlon-Buchanan's No. 1-A C. F. Collins and others, 1,710-18 ft., 264 bbl. Hanlon-Buchanan's No. 1-B C. F. Collins and others, 878 ft., dry. Kimmell Lee & Co.'s No. 1 M. A. Love A, 3,885-4,035 ft., 492 bbl. Magnolia Petroleum Co.'s No. 156 H. Reilly, 1,431-41 ft., 280 bbl. W. H. Peckham's No. 2 M. A. Love, 3,950-80 ft., 752 bbl. Pois & Schulz's No. 25 S. B. Burnett and others, 670-73 ft., 10 bbl. Pois & Schultz's No. 26 S. B. Burnett and others, 666-73 ft., 10 bbl. Pois & Schultz's No. 20 Ed Foster J, 1,290 ft., dry. Shell and Phillips' No. 10 D. R. Preston A, 3,886-3,997 ft., 1,072 bbl.

Wilbarger County

Voohries & Davis' No. 1 W. T. Waggoner, 700 ft., junked. Waggoner Refining Co.'s No. 28 W. T. Waggoner AA, 1,670-95 ft., 55 bbl.

Young County

Bernsen & O'Rourke's No. 1 Mary E. Harlan, 4,026-44 ft., 40 bbl. Bryson & Leidecker's No. 1 J. M. Hall, 4,465-4,502 ft., 57 bbl. Pitzer & West's No. 1 F. Wray, 4,010-20 ft., 51 bbl. Trentman & Rankin's No. 3 J. K. Guinn, 2,760-79 ft., 512 bbl.

EASTERN TEXAS

DALLAS, Tex., Oct. 23.—The wildcat campaign throughout the East Texas district suffered further setbacks during the week as four abandonments were listed as against only two new locations. Field activity showed an upturn, there being 10 wells completed in the East Texas field, two in the Talco field and one in the Long Lake field.

Critical stages were reached in several of the area's closely watched wildcats. In the new Bazette area (Navarro County extension area of the Flag Lake field), Topaz Oil Co. has defined the southern limits of the field with No. 3 Trammel. The test, southernmost in the area, was dry and abandoned at 3,042 ft. Dry Woodbine sand was topped at 2,997½ ft. and water sand was encountered from 3,038 to 3,042 ft. There are now two oil wells and two dry holes in the Bazette area.

In Smith County, intent on drilling a much deeper hole, Texas Co. is cementing casing at 7,616 ft. for protection of the hole in its No. 1 Scritchfield, D. Page Survey, 2 miles northwest of Bullard. Markers on the test show the Georgetown lime from 6,060 to 7,265 ft. and the Fredericksburg group from 7,265 to 7,500 ft., where the top of the Paluxy was reported. No shows have yet been encountered in the deep test.

Rusk County is assured a deep wildcat test at the E. B. Whittington's No. 1 Kangera Brothers, in the I. Castro Survey about 9 miles north of the town of Pirtle. The operator announced that he planned to carry the well into the Trinity section, with first contract to 6,300 ft. and additional hole to 6,850 ft. in the event favorable structural conditions are found. Derrick has been erected, and the test will get under way early this week.

Wildcat abandonments were reported in Smith, Navarro, Ellis, and Nacogdoches counties. J. B. James' (formerly Martin & Moore's) No. 1 B. H. Lunceford, W. Shipp Survey, 3 miles northeast of Garden Valley, was abandoned at a total depth of 2,085 ft., with no showings reported. In Navarro County J. H. Burke abandoned No. 1 Johnson, J. P. Harden Survey, 1½ miles north of Powell, at a total depth of 1,400 ft. The operator has staked location for No. 1 fee, Edmonson Survey, 1 mile north of Powell. Materials are being moved in for immediate drilling. In Ellis County C. M. Beckner has abandoned No. 1 Styles, A. Bullock Survey, 3½ miles southwest of Maypearl, at a total depth of 905 ft. The fourth abandonment was D. McDaniels' No. 1 T. H. Seale, J. A. Cherino Survey, 1½ miles south of the town of Cherino in Nacogdoches County. It was junked and abandoned at 842 ft.

The new wildcat locations included Burke's No. 1 fee in Navarro County and a shallow test by Carter-Bowland as No. 1 J. H. Atchison estate, E. Carrol Survey, 5 miles west of Hillsboro and in Hill County.

Grapeland Area

The wet-gas limits of the Grapeland field in northern Houston County were broadened on the west side when Grapeland Oil Co.'s No. 1 J. J. Guice, Procella Survey, was completed but ungaged at a total depth of 5,958 ft. Gas was showing through perforations in the casing from 5,911-16 ft. and 5,920-40 ft. Location is 1,400 ft. northwest of Cities Service Oil Co.'s No. 1 Hill, nearest gas well. In the general area of the field, Wynne Drilling Co. and Shell Oil Co., Inc., is drilling below 5,700 ft. at their deep 10,000-ft. test on the Dorsey tract, M. Sallas Survey, 2½ miles south of the field. The test is reported checking about level, structurally, with the Hunt Oil Co.'s No. 1 Elliott, oil well in the Grapeland field.

Westmount Oil Co. has announced that it will make a second attempt to secure oil production on its large block in the northwestern part of Hunt County. The company has staked location for No. 1 J. M. Clark, southeast corner of a 100-acre tract in the W. H. Williams Survey, ½ mile northeast of the recent dry hole on the Stevens tract at 4,916 ft.

Limestone County's operation is the testing of the Murray Sammuell's No. 1 C. Barron, W. T. McKinsey Survey, 4 miles northwest of Thornton. The operator

announced that results of electrical survey and sidewall cores indicated possible production in the upper Glenrose, the Pettit, and the Travis Peak formations. Test is now bottomed at a total depth of 6,029 ft.

EAST CENTRAL TEXAS COMPLETIONS
(24-hour gages)

Anderson County

In the Long Lake field Hunt Oil Co.'s No. 2 R. R. Hathcock, S. Sanches Survey, 5,303-34 ft., 103 bbl.

Ellis County

A wildcat, C. M. Beckner's No. 1 Styles, A. Bullock Survey, 3½ miles southwest of Maypearl, junked and abandoned at 965 ft.

Franklin County

In the Talco pool Humble Oil & Refining Co.'s No. 13 Penn-fee, N. Dembriski Survey, 4,236-87 ft., 411 bbl.

Nacogdoches County

D. McDaniels' No. 1 T. H. Seale, J. A. Cherino Survey, junked and abandoned at total depth of 842 ft.

Navarro County

A wildcat, J. H. Burke's No. 1 Johnson, J. P. Harden Survey, dry and abandoned at total depth of 1,400 ft. In the Bazette pool Topaz Oil Co.'s No. 3 Trammel, topped dry sand at 2,997½ ft. and was dry and abandoned at total depth of 3,042 ft.

Robertson County

A wildcat, J. E. Cox's No. 1 Sandifer, H. Henry Survey, 3½ miles SE of Franklin, abandoned location.

Smith County

A wildcat, J. B. James' No. 1 B. H. Lunceford, W. Shipps Survey, 5 miles northwest of Garden Valley, dry and abandoned at total depth of 2,085 ft.

Titus County

In the Talco pool Iowa-Payne Oil Co.'s No. 1 Wilson-Williams, W. N. Baker Survey, 4,276-4,310 ft., 425 bbl.

EAST TEXAS FIELD COMPLETIONS
(1-hour gages)

Gregg County—Longview Area

Canadian Oil Production Co.'s No. 6 J. A. Whittaker, 3,495-3,522 ft., 90 bbl. B. F. Phillips' No. 8 W. M. Callum, 3,535-50 ft., 60 bbl. Stanolind Oil & Gas Co.-Tide Water Associated Oil Co.'s No. 5-A T. Snoddy, 3,533-87 ft., 32 bbl.

Gregg County—Kilgore Area

Doss-Jones Oil Co.'s No. 13 E. Hagler, 3,557-58 ft., 60 bbl. J. J. Jenkins' No. 2 J. T. Crim, 3,538-75 ft., 35 bbl.

(Continued on Page 168)

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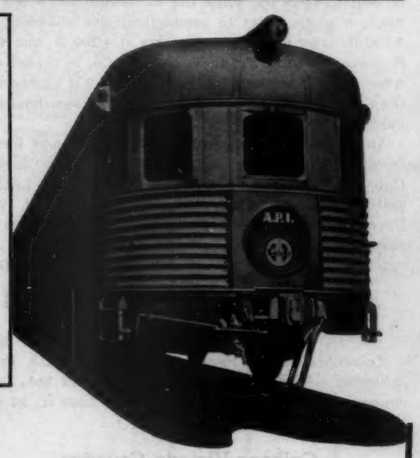

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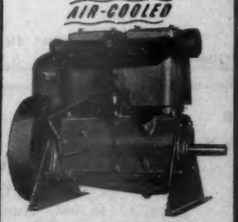

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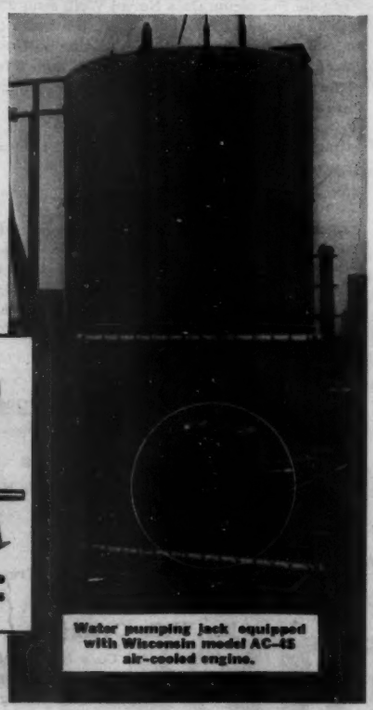

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Southwest Texas District

By
F. L. SINGLETON

East Alice Field Is Extended; Rincon Outposts Disappoint

CORPUS CHRISTI, Tex., Oct. 23.—Additional drilling in the East Alice field, Jim Wells County, was forecast as the result of a half-mile northeast extension and a new sand discovery by Gravis & Buescher's No. 1 Mull, which is being prepared for a production test after a 15-minute drill-stem test at 5,547-62 ft., recovered 1,170 ft. of pipe-line oil and showed 225 lb. of working pressure. Oil sand was cored at 5,547-62 ft. and 5,562-67 ft. Sand and sandy shale with no oil showings was logged at 5,567-97 ft., the total depth, and 7-in. casing was cemented at 5,596 ft.

Distillate production in the Wade City field, Jim Wells County, was definitely extended 1 mile southeast as Rodney DeLange and others' No. 1 Maggie McNeill flowed 63 bbl. of distillate in 20 hours through a 7/64-in. choke under a tubing presure of 1,750 lb. Shut-in casing pressure was 1,900 lb. Production was obtained by perforating casing at 4,786-90 ft. While the well is producing from approximately the same depth as that of the discovery well, the operators are squeezing off the perforations and will reperforate in an attempt to increase the production.

The county gained another Frio-Vicksburg test as location was made by Trinity Drillers, Inc. and others for No. 1 Temple Lumber Co., 330 ft. from the south and east lines of Block 28, Hancock, Loving and Ruby subdivision of the Los Presenos de Arriba grant.

Standard Oil Co. of Texas' No. 1 Jack Casey, discovery well of the Sejita field, Duval County, is running tubing for completion after three drill-stem tests showed distillate. The first test was made at 5,373-98 ft., and on a 40-minute drill-stem test the well showed 1,570 ft. of working pressure, 75 ft. of distillate and 45 ft. of gas-cut drilling mud. The perforations were squeezed off and the well is being completed after a 2-hour drill-stem test at 5,334-45 ft. showed 65 ft. of distillate and 115 ft. of gas-cut mud. A previous test at 5,458-68 ft. also indicated approximately a like quantity of distillate. In view of the various showings, all of which have been from the Cockfield sand, additional development is expected to be started within a few weeks.

More drilling on the southwest side of the Fitzsimmons field, Duval County, is expected as the result of the completion of W. L. Goldston and others' No. 2 Hinojosa, which extended shallow production approximately 1,500 ft. This well failed to find production in the 4,200-4,300-ft. sand and was completed through perforated casing at 3,530-38 ft. flowing an estimated 100 bbl. of oil daily and a small amount of salt water through a ⅛-in. choke.

Two projected deep wells in Bee County were attracting attention. Mills Bennett Production Co. and others' No. 1 D. E. Robinson, northwest of the discovery well of the West Tuleta field, recovered 90 ft. of oil and 100 lb. of working pressure at 3,900-45 ft., which corresponds with the regular Pettus sand section in the West Tuleta field. Additional showings were logged at 4,091-4,101 ft. and the well is coring ahead after drill-stem testing recovered salt water. This is projected to go to the Tertiary Wilcox sand. In the Normanna area J. R. Dougherty's No. 6 Hicks developed 30 lb. working pressure and recovered 120 ft. of mud, cut with oil, on a drill-stem test at 3,488-3,507 ft. The Hockleyensis was topped at 3,416 ft.

The expected extension to the Rincon field, Starr County, failed to materialize as production tests on three outpost wells proved disappointing. W. R. Davis' No. 2-B Slick, approximately 2½ miles southwest of production in Survey No. 528 is reported to have shown salt water on a drill-stem test through perforated casing at 4,170-90 ft. Seven-inch casing was cemented on bottom at 4,321 ft. the previous week after a drill-stem test at 4,176-86 ft. developed a little pipe-line oil. Another sand section was logged at 4,196-4,221 ft. and the section is expected to be tested before the hole is abandoned. Approximately ½ mile southwest of the field's only crude-oil producer, the company's No. 3-B Slick recovered salt water on two drill-stem tests at 4,369-75 ft. and 4,145-48 ft., while the same company's No. 1-A Slick, a south offset to production, was abandoned at 4,829 ft. after two drill-stem tests at 4,200 ft. and 4,300 ft. were failures. Transwestern Oil Co. is reported to have staked locations for No. 1-B and 2-B Cameron in the G.B.&C.N.G. Survey, while additional locations were made by W. R. Davis.

Along the Balcones Fault Line district and located in Milam County, Alex Krause's No. 1 Graves, Jackson Hall Survey, is bottomed in the Buda lime at 1,525 ft. and the operator is preparing to cement casing. With the casing hung at 1,520 ft. the operator bailed out a few barrels of oil and water. Gravity of the oil tested 30.6. After the casing is cemented the lime will be acidized.

COMPLETIONS IN PROVEN FIELDS

Aransas County

McCampbell field: Bay-Tex Oil Corp.'s No. 1 Tripp-Springer, perforated casing 7,215-20 ft., 112 bbl., 7/64-in. choke. Culton and others' No. 2 Berry, 7,423 ft., 97 bbl., ⅛-in. choke.

Calhoun-Victoria Counties

Heyser field: Blanco Oil Co.'s No. 15 Dunwoody, perforated casing 5,563-71 ft., 157 bbl., ⅛-in. choke. Gulf Oil Corp.'s No. 15-B Traylor, sand 5,482-93 ft., 31½ bbl. in 6 hours, ⅛-in. choke.

Duval County

Driscoll field: Continental Oil Co.'s No. 39-A Driscoll, perforated casing 3,343-62 ft., 197 bbl., ¼-in. choke. Fitzsimmons field: Sun Oil Co.'s No. 19 Bruggeman, perforated casing 4,264½-73 ft., 40 bbl., 7/64-in. choke. Hoffman field: Cox & Hamon's No. 15 Hoffman, perforated casing 2,901-10 ft., 65 bbl., jetting. Continental Oil Co.'s No. 9 Collings, sand 2,697-2,703 ft., 35 bbl., jetting. Magnolia Petroleum Co.'s No. 46 Well, sand 2,826-41 ft., 41 bbl., pumping. Longhorn field: Hiawatha Oil & Gas Co.'s No. 1 Denman, perforated casing 4,079-87 ft., 129 bbl., 5/32-in. choke. M. M. Miller & Sons' No. 16 fee, perforated casing 4,036-42 ft., 172 bbl., 5/32-in. choke. Piedra De Lumbre field: Magnolia Petroleum Co.'s No. 40 Duval County Ranch Co., sand 2,109-25 ft., 200 bbl., jetting. S. R. C. field: Texas Co.'s No. 29 Duval County Ranch Co., 1,030 ft., 63 bbl., jetting.

Guadalupe County

Darst Creek field: Bluehawk Oil Co.'s No. 3 Richburg, 2,583 ft., 200 bbl., open tubing. Humble Oil & Refining Co.'s No. 27-A Denman, 2,626 ft., 125 bbl., pumping. Humble Oil & Refining Co.'s No. 4 Dowdy, 2,537½ ft., 161 bbl., flowing and pumping. Zoboroski field: J. E. Clark and others' No. 1 Zoboroski, 2,443 ft., dry and abandoned.

Hidalgo County

Samfordyce field: R. S. Dean's No. 2-C Guerra, perforated casing 2,871-74 ft., 100 bbl., jetting.

Jim Hogg-Brooks Counties

Kelsey field: Humble Oil & Refining Co.'s No. 28 McGill, 4,753 ft., 24 bbl., 7/64-in. choke.

Jim Hogg County

Colorado field: K. D. Harrison's No. 4-A Trevino, sand 3,059-72 ft., 120 bbl., ¼-in. choke.

Jim Wells County

Ben Bolt field: Bridwell Oil Co.'s No. 2-A Hoffman, perforated casing 5,256-62 ft., 170 bbl., ⅛-in. choke. H. J. Moser's No. 2 Perales, perforated casing 5,405-12 ft., 90 bbl., 3/32-in. choke. Reynolds field: Texas Gulf Producing Co.'s No. 6-A Miller, perforated casing 5,160-63 ft., 303 bbl., 7/64-in. choke. South Alice field: Humble Oil & Refining Co.'s No. 1 Clark, 5,354 ft., dry and abandoned. Shell Oil Co.'s No. 3 Little, 5,341 ft., dry and abandoned.

Live Oak County

Oakville field: Henderson Coquat's No. 4 Rosenbrock, 1,940 ft., gas well.

Nueces County

Agua Dulce field: Union Producing Co.'s No. 1-B Pyle, perforated casing 4,609-36 ft., gas well. Union Producing Co.'s No. 6 Simmonds, 6,023 ft., dry and abandoned. Union Producing Co.'s No. 6 Talbert, perforated casing 4,890-4,906 ft., gas well.

Refugio County

La Rosa field: Coronado Corp.'s No. 7 Michna, perforated casing 5,817-27 ft., gas well. Hewitt & Dougherty's No. 8-B Rooke, perforated casing 5,732-39 ft., 135 bbl., ⅛-in. choke. Tomoconnor field: Quintana Petroleum Corp.'s No. 34 Heard, perforated casing 5,860-68 ft., 1,333 bbl., ⅜-in. choke.

San Patricio County

East White Point field: Houston Oil Co.'s No. 3 fee, perforated casing 5,652-62 ft., 185 bbl., 5/32-in. choke. O. W. Killam's No. 3 Taft Syndicate, sand 5,598-5,608 ft., 130 bbl., ⅛-in. choke. Sinclair Prairie Oil Co.'s No. 3 State, perforated casing 5,629-35 ft., 96 bbl., ⅛-in. choke.

Victoria County

Cologne field: Houston Oil Co.'s No. 1 Martin, perforated casing 2,860-75 ft., dry gas well. McFaddin field: Barnsdall Oil Co.'s No. 23 McFaddin, 4,407 ft., 145 bbl., jetting.

Zapata County

Mirando Valley field: Buffalo Oil Co.'s No. 1-D Hinnant, 1,988½ ft., 45 bbl., jetting. Interstate Minerals, Inc.'s No. 2-B Lopez, 1,848 ft., 10 bbl., jetting.

Gulf Coast Fields

(Continued from Page 145)

Polk County

Segno field: Gulf Oil Corp.'s No. 22 Wing, sand 8,061-76 ft., 429 bbl., ¼-in. choke.

Tyler County

Joe's Lake field: Republic Production Co.'s No. 25 Hurd, sand 7,698-7,702 ft., 238 bbl., ¼-in. choke.

Wharton County

Magnet field: Humble Oil & Refining Co.'s No. 7 Cockburn, 5,543 ft., 120 bbl., ⅛-in. choke.

East Texas Fields

(Continued from Page 167)

Rusk County—Joiner Area

Hunt Oil Co.'s No. 16 A. B. Wooley, 3,680-3,771 ft., 45 bbl. Hunt Oil Co.'s No. 28 C. Young, 3,655-3,755 ft., 44 bbl. Alex McCutchin's No. 2 R. G. Mason, 3,603-18 ft., 95 bbl. Snetcher-Pittman's No. 9 F. J. Cox, 3,635-40 ft., 52 bbl.

Upshur County—Longview Area

B. F. Phillips' No. 1 C. B. Everett, 3,617-18 ft., 30 bbl.

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ont., Oct. 21.—With Turner Valley crude storage reduced to approximately 280,000 bbl., the Alberta Conservation Board increased the daily crude allowable from 23,000 to 26,000 bbl., effective October 11. Under the new schedule, Home Oil Co.'s No. 2 Milliarville, in North Turner Valley, remains the largest producer, being increased from 716 to 859 bbl.

New Gas Restrictions

Proposals submitted to Turner Valley operators with a view to further eliminating gas wastage and prolonging the life of the field contemplate restriction of the annual permitted gas flow to 12,000,000,000 cu. ft. At present the gas taken from the field aggregates around 15,000,000,000 cu. ft. a year, and at one time the peak output is believed to have been 500,000,000 cu. ft. a day. The new plan permits gas production only for fuel and power purposes. Absorption plants, previously operated on wet gas from naphtha wells, would have to depend largely on gas from crude wells. The Royalite Oil Co.'s absorption plant in the main gas area would, however, continue to extract gasoline from gas purchased by the Canadian Western Natural Gas, Light, Heat & Power Co.

Tests in the Lime

In Section 29-18-2w5, Royal Canadian Oil Co.'s No. 3, LSD 12, bottoming at 8,656 ft., showed a good flush production on a drill-stem test of the upper porous horizon of the Madison limestone. The test is 277 ft. in the limestone. It is near the western edge of the producing area.

In Section 32-18-2w5, Royalite Oil Co.'s No. 42, LSD 4, finished in the black lime at 8,491 ft., some 469 ft. in the Madison and is acidizing and testing production. In Section 25-19-3w5, West Central Turner Valley, Argus Royalties' No. 1, LSD 14, is below 7,212 ft. after getting the Madison limestone at 6,909 ft., and drilling in the hard cap above the lower porous zone. Drill-stem test of the upper horizon at 7,138 ft., 229 ft. in the lime, showed both gas and oil in substantial quantities.

New Drilling Planned

In North Turner Valley, Royalite Oil Co. is taking over a number of drilling sites on small acreage. Announcement has been made of the purchase of LSD 10, Section 22-20-3w5, for 1,100 shares of Royalite stock. Royalite's No. 48 has been spotted in LSD 12, Section 27-20-3w5, in the same section as Royalite's No. 29 producer.

In South Turner Valley, arrangements have been made between Commoil, Ltd., and the Scott-McLeod-Thompson Syndicate for drilling No. 3 Commoil in LSD 13, Section 29-18-2w5. This is the former Alco Oils acreage on which P. & H.'s No. 1 Alco was drilled to 1,500 ft. A new hole will be started close to the location.

Tests in the Foothills

On the Pouce Coupe structure in the northern foothills, Benedum & Trees' No. 1 Guardian, Section 7-80-12w6, is in the lime below 5,456 ft.

In the Steveville field, east of Calgary, Standard of British Columbia's No. 1, LSD 13, Section 22-20-12w4, is below 300 ft. Location is near the town of Princess and will be known as C. P. R. Princess' No. 1.

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Michigan Field Report

By O. C. PRESSPRICH

2,880-Bbl. Well in Walker Field Leads Week's Results

SAGINAW, Mich., Oct. 23.—Though five wildcats in scattered locations in Michigan were abandoned last week as dry holes, development in established fields continued unabated, 13 new oil wells having been added to the total, along with two good gas wells. The list of 25 completions included a total of 9 dry holes and 1 location abandoned.

Daily initial potential was increased in Michigan by 7,850 bbl. as a result, while flow from the two gas wells amounted to better than 18,000,000 cu. ft. a day. Smith Petroleum Co. had the week's best oil well, with a potential rating of 2,880 bbl. a day, completed in Section 29 of Walker Township, Kent County. Section 34 of Redding Township, Clare County, also had a good well as Pure Oil Co. completed No. 1 Petrowecheff for natural production estimated at 1,944 bbl. a day.

Exploration disappointments were reported from Casco Township, Allegan County; Monterey Township, Allegan County; Rutland Township, Barry County; Fork Township, Mecosta County, and Zeeland Township, Ottawa County.

Central Michigan wildcatting promised definite conclusions within a few days at several locations with Sun Oil Co. below 1,500 ft. with a test in Missaukee County's Norwich Township, and being around 3,700 ft. with its Davis test in Winterfield Township, Clare County, approximately 7 miles north of the prolific Freeman-Redding production. Testing of deeper strata is scheduled by J. V. Wicklund Development Co. in Section 18 of Buckeye Township, Gladwin County, in the pool's discovery well.

Meanwhile there were reports in circulation that a new Michigan area is slated for testing, an unidentified location having been selected for drilling in Genesee County, near the city of Flint.

The weekly list of permits for oil and gas tests in the state, issued by the State Conservation Department, included in its total of 34, one for Section 1, Lakefield Township, Saginaw County, where Robert Bond of Mount Pleasant has started operations.

Increased activity is indicated for Clare's Redding field, where five new wells are getting under way, Pure Oil Co. drilling four of them. Continued rapid development of the Walker pool in Kent County was assured with selection of seven more locations while additional wildcatting was in prospect in Mecosta, Oceana, Gladwin, and Kalamazoo counties.

Allegan's Salem field last week had three producers and one dry hole abandoned, best wells being W. R Borough's No. 2 Fein in Section 3, which did 390 bbl. a day naturally, and Socony-Vacuum Oil Co., Inc.'s No. 3 Twining, in Section 3, flowing 259 bbl. in 17 hours, after which ft was pinched in to 10 bbl. an hour.

The first test in Cannon Township, Kent County, was unsuccessful, Huffman Drilling Co. abandoning operations on No. 1 Barker in Section 20, after going down 2,410 ft. Walker field had five completions, Wyoming field three, with Cryden Petroleum Co. disappointed by one of the very few dry holes that have been drilled in Walker Township. Smith Petroleum Co.'s big well, No. 2 P. J. Taalman, in Section 29, was in the proven area, as was Wolverine Natural Gas Corp.'s No. 4 Frances Hoey, Section 30, with its initial potential, naturally, of 960 bbl. a day. Turner Petroleum Co. made up in part for its Walker failure with one of the best completions recorded to date in the as yet uncertain Tallmadge Township pool in Ottawa County. There No. 2 Sund, after acid treatment, did 270 bbl. in 6 hours.

Van Buren County development was on the ebb and in Section 12 of Columbia Township Regis Cook abandoned location for a test after W. E. Dotson gave up on the No. 2 Stockton at 1,200 ft.

The new gas wells are those of W. E. Ross, in Section 10, Clayton Township, Arenac County, and American Production Co. in Section 17 of Lincoln Township, Clare County.

State-owned land leased for oil and gas development has returned $264,449 to the state general fund in the first 9 months of 1939, bringing the 13-year total income from leased lands to $2,213,985.

The Michigan completion summary for the past week follows:

Allegan County

Casco Township (1n-16w)—R. H. Grant abandoned No. 1 Lyman Brothers, wildcat, SE NW NW Section 23, at a total depth of 1,250 ft.

Monterey Township (3n-13w)—Hugh H. Heinig's No. 1 Zeal Lang Shaw, NW SW SE Section 29, was another wildcat failure, abandoned at 1,648 ft.

Salem Township (4n-13w)—There were three new producers and one dry hole in Salem. W. R. Borough, Inc.'s No. 2 Fein, NE SW NW Section 2, rating 390 bbl. a day, naturally, at 1,692 ft., was about on a par with Socony-Vacuum Oil Co., Inc.'s No. 3 Harold Twining, NE SE SE Section 3, total depth 1,645 ft., which produced 259 bbl., naturally, in 17 hours. Both are new Salem developments. Gulf Refining Co.'s No. 1 J. Zerfas, SE SW NE Section 15, rated 70 bbl. a day after it was acidized. Completion depth was 1,584 ft. No. 1 S. Dusendang, SW NW NE Section 23, was abandoned by A. S. Cochran at 1,620 ft.

Arenac County

Clayton Township (20n-4e)—Flow was 8,020,000 cu. ft. a day from the gas well, No. 1 Markus Kalander, C SW NW Section 10, completed by W. E. Ross at a total depth of 1,153½ ft.

Barry County

Rutland Township (3n-9w)—Sun Oil Co.'s No. 1 Bernice Wilcox, NE NE SW Section 5, was a wildcat failure, abandoned at 2,701 ft.

Clare County

Lincoln Township (18n-5w)—American Production Co.'s No. 3 D. W. Frackelton, C N½ NW Section 17, total depth 1,531 ft., was completed as a gas well, producing 10,250,000 cu. ft. a day.

Redding Township (19n-6w)—Estimated natural daily potential was 1,944 bbl. from Pure Oil Co.'s No. 1 George A. Petrowecheff, C N½ SW NW Section 34, completed at 3,924 ft. in the Temple district.

Kent County

Cannon Township (8n-10w)—First attempt to get oil in Cannon Township failed as Huffman Drilling Co. abandoned No. 1 Barker, wildcat, NE NE NE Section 20, at 2,410 ft.

Walker Township (6n-12w)—After acid treatment, production was at the estimated rate of 250 bbl. a day from Certain-Teed Products Corp.'s No. 4 Certain-Teed, NW SW NW Section 3, completed at 1,777 ft.

Walker Township (7n-12w)—Smith Petroleum Co. had the best completion of the week when No. 2 P. J. Taalman, NW NW SW Section 29, came in for a natural potential of 2,880 bbl. a day. The well's depth is 1,868 ft. Another good well was Wolverine Natural Gas Corp.'s No. 4 Frances Hoey, NE NE SW Section 30, completed at 1,889 ft. and having initial natural potential of 960 bbl. a day. Cryden Petroleum Co. recorded one of the infrequent Walker failures when No. 1 Smith-Burrows, C S½ N½ SE NW Section 31, was abandoned as dry at 1,985 ft. James J. McGerry, Inc.'s No. 1 Charles L. Patrick, NW SW NE Section 31, did 75 bbl. a day, naturally, completed at a total depth of 1,886 ft. Louis Rose's No. 1 Joseph A. Radawski, NW SW NW Section 31, after being treated with acid, rated 300 bbl. a day.

Wyoming Township (6n-12w)—Production after acid treatment was 100 bbl. a day from Grand Rapids Gravel Co.'s No. 7, SW NW SW Section 4, total depth 1,811 ft. Similar results were obtained from Lamar Oil Co.'s No. 8 Grand Rapids Gravel Co., NW SE SE Section 3, at 1,807½ ft. Rex Oil & Gas Co.'s No. 3 City of Grand Rapids, SW NW SW Section 3, completed at 1,773 ft., rated 160 bbl. a day after acidizing.

Mecosta County

Fork Township (16n-7w)—Turner Petroleum Co.'s No. 1 William Bongard, C S½ NW NE Section 21, a wildcat, was abandoned as dry at 3,832 ft.

Ottawa County

Tallmadge Township (7n-13w)—After acid treatment, Turner Petroleum Co. got 270 bbl. of crude in 6 hours from No. 2 Fred Sund, NW SE SE Section 25.

Zeeland Township (5n-14w)—Fortney Oil Co.'s No. 1 John Essing, NE NE SW Section 25, an exploratory test, was abandoned as a dry hole at a depth of 1,744 ft.

Van Buren County

Columbia Township (1s-15w)—Regis Cook abandoned location on No. 1 George Baker, SW SE SE Section 12, as W. S. Dotson's No. 3 Roy Stockton, SE SW NE Section 12, failed to show oil and was abandoned at a depth of 1,200 ft.

Western Kentucky

(Continued from Page 148)

Inc., dry and abandoned at 1,833 ft. Staves Drilling Co.'s No. 4 L. I. Ingleheart, estimated 50-bbl. well from Jett sand, total depth 1,292½ ft. No. 5 is a location. Utica district, Evans Oil & Gas Co.'s No. 6 J. M. Clark, old Barlow sand gas well, deepened from 1,453 ft. to 1,760 ft., dry and abandoned. J. C. Ellis' No. 2 Ellis, 15-bbl. well in Jett sand, total depth 1,155 ft. Stewart, Snyder and Major Oil Co.'s No. 2 Roy Hansford, estimated 50-bbl. well in Bethel sand, total depth 1,479 ft. Creek Drilling Co.'s No. 6 Gus Morgan, dry hole at 1,766 ft. C. E. Daugherty and others' No. 3 Rex O'Flynn, drilled deeper from Jett sand through Jones sand, 70-bbl. well, total depth 1,207 ft. Cane Run School district, Cane Run Petroleum Co.'s No. 3 R. E. Jackson, 30-bbl. well in upper and lower Jett sands, total depth 674 ft. Pellville district, Barney Calvert's No. 3 Frank Miles, 10 bbl. a day from Jett sand, total depth 485 ft.

Hancock County, Patesville district, C. H. Krysl's No. 2 Ebbie Boling, moving in.

Henderson County, Corydon district, Sun Oil Co. and Kentucky Natural Gas Co.'s No. 2 George F. Trigg, 120-bbl. well, natural flow, McClosky lime, total depth 2,613 ft.

Livingston County, Tiline district, L. E. Maxson's No. 1 H. F. Wells, drilling at 90 ft.

McLean County, Island district, South Penn Oil Co.'s No. 9 Alma Nall, estimated 50 bbl. a day, from Jett sand, total depth 1,455 ft.

Meade County, Andyville district, Northern Oil Corp.'s No. 1 J. M. Greenwall, drilling at 87 ft.

Ohio County, Davidson Station district, DeHart and Lykins' No. 1 Sadie Fentress, dry and abandoned at 734 ft. Ken State Oil Co.'s No. 5 T. P. Fentress, estimated 25 bbl. a day from Cunningham sand, total depth 629 ft. Magan district, Harold Smith's No. 8 Jess Mattingly, 15-bbl. well in Jett sand, total depth 400 ft. Maxwell district, J. C. Miller, trustee's No. 6 J. F. Smith, 10-bbl. well in Jett sand, total depth 748 ft. Sunnydale district, Roy Taylor's No. 3 C. E. Wimsatt, moving in.

Webster County, Beech Grove district, H. C. Smith and others' No. 1 O. H. Parker, dry hole at 1,352 ft.

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S.T.R.	Depth	Status—
General Pet. Corp., No. 15 Poggi, Torrance, Los A.	30- 4-13	2,991	sd. sh. drlg.
Union Oil, No. 71 Callender, Dominguez, Los Ange.	32- 3-13	7,485	flow 1,650 b.d.
Shell Oil, No. 100 Reyes, Dominguez, Los Angeles	33- 3-13	2,591	sd. sh. drlg.
Union Oil, No. 35 Rosecrans, Rosecrans, Los Ange.	19- 3-13	5,994	sd. sh. drlg.
Barnsdall Oil, No. 1 Darling, Rosecrans, Los Ange.	20- 3-13	8,957	salt wtr.
Basin Oil, No. 1 Western, Potrero, Los Angeles	28- 2-14	6,377	testing
Casa Grande Oil, No. 1 Lopez, San Fernando, Los A.	1- 2-15	2,130	gr. sd. drlg.
Tide Water A. O., No. 12 Porter, Aliso Can., L. A.	27- 3-16	3,770	hd. sd. drlg.
Tide Water A. O., No. 11 Fernando, Aliso Can., L. A.	27- 3-16	4,790	sd. sh. drlg.
Redwood Oil, No. 1-A Mitchell, Mint Canyon, L. A.	22- 4-15	530	sd. sh. drlg.
Tamas Oil, No. 1 Perkins, Newhall, Los Angeles	14- 3-16	2,096	sd. sh. drlg.
Barnsdall Oil, No. 8 R.S.F., Newhall, Los Angeles	27- 4-17	1,997	sd. sh. drlg.
General Pet. Corp., No. 101 P.E., Wilmington, L. A.	2- 5-13	2,980	sd. sh. drlg.
Brookline Oil, No. 4 Harbor, Wilmington, Los Ang.	4- 5-13	3,698	flow 480 b.d.
Brookline Oil, No. 1 Nix, Wilmington, Los Angeles	35- 4-13	5,298	deepening
Hancock Oil, No. 22-A Harbor, Wilmington, Los A.	2- 5-13	4,057	flow 1,350 b.d.
Long Beach Dev., No. 10-Y Harbor, Wilming., L. A.	2- 5-13	3,917	flow 530 b.d.
Long Beach Dev., No. 11-Y Harbor, Wilming., L. A.	2- 5-13	4,037	flow 350 b.d.
Long Beach Dev., No. 12-Y Harbor, Wilming., L. A.	2- 5-13	3,987	flow 290 b.d.
Long Beach Dev., No. 3-W Harbor, Wilming., L. A.	3- 5-13	4,057	O.S. drlg.
Long Beach Dev., No. 4-W Harbor, Wilming., L. A.	3- 5-13	4,027	flow 275 b.d.
Long Beach Dev., No. 5-W Harbor, Wilming., L. A.	3- 5-13	3,925	O.S. drlg.
Long Beach Dev., No. 6-W Harbor, Wilming., L. A.	3- 5-13	2,475	sd. sh. drlg.
Long Beach Dev., No. 7-W Harbor, Wilming., L. A.	3- 5-13	2,770	sd. sh. drlg.
Long Beach Dev., No. 12-X Harbor, Wilming.; L. A.	2- 5-13	2,373	sd. sh. drlg.
McWherter, C. L., No. 4 Channel, Wilmington, L. A.	2- 5-13	2,880	sd. sh. drlg.
Morgan, Roy, No. 1 Ruth, Wilmington, Los Angel.	35- 4-13	3,420	completing
Royalty Service Corp., No. 3 Packard, Wilm., L. A.	33- 4-13	5,716	O.S. drlg.
Royalty Service Corp., No. 2-B Santa Fe, Wil., L. A.	33- 4-13	5,713	flow 425 b.d.
Signal O. & G., No. 4-S.P., Wilmington, Los Angel.	3- 5-13	4,080	O.S. drlg.
Union Pacific R. R., No. 118, Wilmington, Los An.	34- 4-13	3,678	P.B. 3,618
Union Pacific R. R., No. 119, Wilmington, Los An.	3- 5-13	3,270	sd. sh. drlg.
Union Pacific R. R., No. 120, Wilmington, Los An.	3- 5-13	4,030	sd. sh. drlg.
Union Pacific R. R., No. 19-E, Wilmington, Los A.	3- 5-13	2,182	sd. sh. drlg.
Union Pacific R. R., No. 20-E, Wilmington, Los A.	3- 5-13	3,180	sd. sh. drlg.
Kern Oil, No. 24 Monterey, Montebello, Los Angel.	2- 2-12	7,655	flow 990 b.o.
Kern Oil, No. 31 Monterey, Montebello, Los Angel.	2- 2-12	3,464	sd. sh. drlg.
Union Oil, No. 5 Wilcox, Montebello, Los Angeles	11- 2-12	7,534	completing
Union Oil, No. 6 Wilcox, Montebello, Los Angeles	11- 2-12	2,983	sd. sh. drlg.
Union Oil, No. 7 Wilcox, Montebello, Los Angeles	11- 2-12	7,640	O.S. drlg.
Union Oil, No. 10 Howard & Smith, Monteb., L. A.	11- 2-12	7,405	O.S. drlg.
Union Oil, No. 7 Paul Howard, Montebello, Los A.	11- 2-12	7,630	O.S. drlg.
Albertson Oil, No. 1 Schnakenburg, Monteb., L. A.	3- 2-12	7,686	completing
Beacon Oil, No. 1 Caneer, Montebello, Los Angeles	11- 2-12	6,880	sd. sh. drlg.
Bush Oil, No. 1 Mihlfred, Montebello, Los Angeles	3- 2-12	4,894	sd. sh. drlg.
Bush Oil, No. 1 Zanetti, Montebello, Los Angeles	3- 2-12	6,263	sd. sh. drlg.
B-A Oil Prod., No. 1 H. & S., Montebello, Los Ange.	11- 2-12	7,634	flow 425 b.d.
B-A Oil Prod., No. 2 H. & S., Montebello, Los Ange.	11- 2-12	7,635	flow 535 b.d.
Caminol, No. 2-16 Cowan, Montebello, Los Angeles	2- 2-12	7,184	sd. sh. drlg.
Caminol, No. 3-17 Cowan, Montebello, Los Angeles	3- 2-12	3,855	sd. sh. drlg.
C. A. P. Oil, No. 1 Dutch, Montebello, Los Angeles	11- 2-12	6,072	sd. sh. drlg.
Crestline Oil, No. 1 Beverly, Montebello, Los Ange.	11- 2-12	7,186	sd. sh. drlg.
Crail Bros., No. 2 Cowan, Montebello, Los Angeles	1- 2-12	6,191	sd. sh. drlg.
Dutch Oil, No. 1 Schelnik, Montebello, Los Angeles	3- 2-12	7,282	sd. sh. drlg.
East Mont. Oil, No. 1 Rissinger, Montebello, L. A.	12- 2-12	7,621	flow 1,310 b.d.
Fullerton Oil, No. 2 Trustee, Montebello, Los Ange.	12- 2-12	7,605	flow 1,041 b.d
Fullerton Oil, No. 2 Scott, Montebello, Los Angeles	1- 2-12	7,630	completing
Graham-Loftus Oil Corp., No. 2 Coffman, Mon., L. A.	11- 2-12	7,415	O.S. drlg.
Hathaway Oil, No. 2 Dore, Montebello, Los Angeles	11- 2-12	6,605	redrlg. 6,398
Larson Drlg., No. 3 Van Deusen, Montebello, L. A.	11- 2-12	4,580	sd. sh. drlg.
Mabee, J. E., No. 36 Monterey, Montebello, Los A.	3- 2-12	7,550	O.S. drlg.
Master Pet., No. 1 Grant, Montebello, Los Angeles	2- 2-12	2,638	O.S. drlg.
Mont. Res. Oil, No. 1 Reservoir, Montebello, L. A.	2- 2-12	7,637	completing
Mono Oil, No. 1 Foreman, Montebello, Los Angeles	2- 2-12	7,286	sd. sh. drlg.
Montebello Oil, No. 1 Nordon, Montebello, Los An.	3- 2-12	5,996	sd. sh. drlg.
Pacific-Amer. Oil, No. 1 Groen, Montebello, Los A.	11- 2-12	7,162	sd. sh. drlg.
Pongratz Pet., No. 2 Newmark, Montebello, Los A.	3- 2-12	5,631	cleaning out
Sunset Oil, No. 1 Howell, Montebello, Los Angeles	11- 2-12	7,660	completing
Sunset Oil, No. 1 Robinson, Montebello, Los Angeles	12- 2-12	4,583	sd. sh. drlg.
Star Pet., No. 1 Community, Montebello, Los Ang.	11- 2-12	7,590	flow 615 b.d.
Star Pet., No. 1 Caneer, Montebello, Los Angeles	11- 2-12	4,982	sd. sh. drlg.
Texas, No. 1 Wilcox, Montebello, Los Angeles	3- 2-12	7,450	sd. sh. drlg.
Traders Oil, No. 2 Center, Montebello, Los Angeles	2- 2-12	6,987	sd. sh. drlg.
United Mont. Oil, No. 1 Lot, Montebello, Los Ange.	11- 2-12	7,666	completing
United Mont. Oil, No. 2 Lot, Montebello, Los Ange.	11- 2-12	7,432	O.S. drlg.
United Mont. Oil, No. 3 Lot, Montebello, Los Ange.	11- 2-12	5,176	sd. sh. drlg.
Wood-Callahan Oil, No. 1 Thill, Montebello, Los A.	11- 2-12	5,996	sd. sh. drlg.
York Oil, No. 1 Lehman, Montebello, Los Angeles	10- 2-12	7,660	flow 395 b.d.
York Oil, No. 6 Mulholland, Montebello, Los Ange.	2- 2-12	7,180	sd. sh. drlg.
York Oil, No. 1 Long, Montebello, Los Angeles	3- 2-12	7,361	sd. sh. drlg.
Kelso, F. W., No. 1 Brea, Puente Hills, Los Angeles	12- 2-10	2,405	fish D.P.
Hilldon Oil, No. 3 Amebco, Long Beach, Los Ange.	13- 4-13	5,290	pmp. 105 b.d.
Dormax Oil, No. 1 Signal, Long Beach, Los Ange.	30- 4-12	9,896	O.S. drlg.
Atlantic Oil, No. 12 Signal, Long Beach, Los Ange.	19- 4-12	3,230	O.S. drlg.
Richfield Oil Corp., No. 8-B City, Long Beach, L. A.	29- 4-12	4,099	sd. sh. drlg.
El Hondo Pet., No. 1 Venago, Long Beach, Los An.	24- 4-13	8,430	sd. sh. drlg.
Rolling Hills Pet., No. 1 Weston, Palos Verd., L. A.	27- 4-14	6,490	sd. sh. drlg.
Great Northern Oil, No. 1 Oak, Richfield, Los Ang.	28- 3- 9	1,602	sd. sh. drlg.
Sonwell Oil, No. 1 Anaheim, East Coyote, Orange	13- 3-10	3,490	sd. sh. drlg.
Union Oil, No. 21 Hole, East Coyote, Orange	22- 3-10	2,962	sd. sh. drlg.
Master Pet., No. 1 Wright, East Coyote, Orange	19- 3- 9	4,160	will deepen
Southwest Expl., No. 22 State, Hunting. B., Orange	10- 6-11	5,203	completing
Owen, W. D., No. 1 Montgomery, Hunt. B., Orange	36- 5-11	3,390	sd. sh. drlg.
Petremont Oil, No. 2 Burton, Huntington B., Oran.	36- 5-11	3,781	sd. sh. drlg.

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S.T.R.	Depth	Status—
Union Oil, No. 21 Squires, Santa Maria, S. Barbara	26- 9-34	3,950	pmp. 40 b.d.
Union Oil, No. 2-3 O'Donnell, Santa Maria, Santa B.	29-10-34	4,394	sd. sh. drlg.
Lomas, E. H., No. 1 Reg, Santa Maria, Santa Bar.	29-10-34	5,292	sd. sh. drlg.
Gerard, W. R., No. 2 Breneiser, Santa Maria, S. B.	27-10-34	2,188	sd. sh. drlg.
Sunset Oil, No. 1 Shore, Carpinteria, Santa Barbara	32- 4-25	3,140	hd. sh. drlg.
Trans-Oceanic Oil, No. 1 Mesa, Santa Barbara, S. B.	28- 4-27	1,584	cleaning out
Coronet Oil, No. 1 Crown, Ojai, Ventura	17- 4-21	2,298	pmp. wtr.
Renard Oil Corp., No. 1, Sespe, Ventura	6- 4-19	712	hd. sh. drlg.
Continental Oil, No. 12 Grubb, San Miguelito, Ven.	24- 3-24	6,294	sd. sh. drlg.
C. C. M. Oil, No. 2-B Hobson, Rincon, Ventura	8- 3-24	4,046	rigging up
C. C. M. Oil, No. 29-B Hobson, Rincon, Ventura	16- 3-24	4,800	flow 299 b.d.
Tide Water A. O., No. 42 V.L.W., Ventura Ave., V.	23- 3-23	8,178	sd. sh. drlg.
Tide Water A. O., No. 44 V.L.W., Ventura Ave., V.	23- 3-23	7,859	sd. sh. drlg.
Tide Water A. O., No. 15 McGonigle, Vent. Ave., V.	23- 3-23	9,290	sd. sh. drlg.
Tide Water A. O., No. 16 McGonigle, Vent. Ave., V.	23- 3-23	6,976	sd. sh. drlg.
Tide Water A. O., No. 66 Lloyd, Ventura Ave., Ven.	26- 3-23	6,492	sd. sh. drlg.
Tide Water A. O., No. 121 Lloyd, Ventura Ave., Ve.	23- 3-23	8,298	sd. sh. drlg.
Tide Water A. O., No. 21 Hartman, Vent. Ave., V.	22- 3-23	5,884	sd. sh. drlg.
Shell Oil, No. 102 Taylor, Ventura Ave., Ventura	29- 3-23	7,706	completing
Shell Oil, No. 103 Taylor, Ventura Ave., Ventura	21- 3-23	3,466	sd. sh. drlg.
Shell Oil, No. 106 Taylor, Ventura Ave., Ventura	29- 3-23	3,141	sd. sh. drlg.
Shell Oil, No. 108 Taylor, Ventura Ave., Ventura	21- 3-23	900	sd. sh. drlg.
General Pet. Corp., No. 16 Barnard, Vent. Ave., V.	28- 3-23	8,452	fishing
Cal. Alliance Pet., No. 1 Hartman, Vent. Ave., V.	22- 3-23	7,495	sd. sh. drlg.
Lloyd Corp., No. 3 Dabney, Ventura Ave., Ventura	23- 3-23	9,420	O.S. drlg.
Lloyd Corp., No. 4 Dabney, Ventura Ave., Ventura	23- 3-23	8,751	sd. sh. drlg.
Trico O. & G., No. 1 Newland, Delano gas field, K.	29-24-23	2,512	18,000 m.c.f.
Belridge Oil, No. 1-27, North Belridge, Kern	1-28-20	7,863	sd. sh. drlg.
Belridge Oil, No. 28-15, North Belridge, Kern	28-27-20	7,180	sd. sh. drlg.
Belridge Oil, No. 26-39, North Belridge, Kern	26-27-20	8,320	sd. sh. drlg.
Tide Water A. O., No. 24, North Belridge, Kern	21-27-20	8,198	sd. sh. drlg.
Abbott, F. E., No. 1 Gamble, Blackwell's Cor., Kern	7-27-20	214	sd. sh. drlg.
Texas, No. 1 McLennan, Shale Hills, Kern	19-27-19	1,758	dry; abd.
Texas, No. 1 Beer, Devil's Den, Kern	6-26-19	2,240	sd. sh. drlg.
O'Reily, Frances, No. 2 Seale, Edison, Kern	5-30-29	4,103	D.P. stk.
Grizzly Bear Oil, No. 4 Kelley, Round Mountain, K.	6-28-28	1,815	idle
Dick, W. T., No. 5 Kern, Kern River, Kern	34-28-28	650	pmp. dry
Dick, W. T., No. 6 Kern, Kern River, Kern	34-28-28	418	sd. sh. drlg.
Dick, W. T., No. 8 Kern, Kern River, Kern	34-28-28	471	sd. sh. drlg.
Dick, W. T., No. 10 Kern, Kern River, Kern	34-28-28	266	sd. sh. drlg.
Crestmont Oil, No. 1 Hesse, Kern River, Kern	22-28-28	2,260	sd. sh. drlg.

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Acd., acidized.
B.O., barrels of oil.
B.P.D., barrels per day.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
B. ck., bottom choke.
Br. sh., brown shale.
B.S., basic sediment.
C.&P., cellar and pits.
Cd. or Crd., cored.
C.D., correct depth.
Cg., coring.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg., or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.S.T., drill-stem test.
D.P., drill pipe
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., old well drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging back.
P.B.P., pulling or pulled big pipe.
P.L., pipe line.
P.L.O., pipe-line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Recvd., recovered.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sdy. sh., sandy shale.
Sdtrk. or St., sidetracking.
S.D.P.L., shutdown for pipe line.
S.D.O., or S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas, and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing).
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T. ck., top choke.
T.P., tubing pressure.
Tr., tract.
Tstd., tested.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C. or W.O.C.S., waiting on cement to set.
W.O.O., waiting on orders.
W.P., working pressure.
W.S.O., water shutoff.
W.S.S.O.K., water shutoff O.K.
W.S.R. or W.O.S.R., awaiting standard rig.
Wtr., water.

Sleeper Ridge Oil, No. 1 Kern, Kern River, Kern.	15-29-28	1,410	cleaning out
Helm & Smith, No. 14 Kern, Kern River, Kern ..	34-28-28	683	pmp. dry
Helm & Smith, No. 15 Kern, Kern River, Kern ...	34-28-28	440	sd. sh. drlg.
Hast Oil, No. 6 Kern, Kern River, Kern	34-28-28	565	cleaning out
D. B. K., No. 11 Kern, Kern River, Kern	34-28-28	388	sd. sh. drlg.
Ring Oil, No. 5-A Jones, Mount Poso, Kern	29-26-28	1,779	pmp. 310 b.d.
Ring Oil, No. 8 Shapiro, Mount Poso, Kern	32-26-28	1,710	O.S. drlg.
Hogan Pet., No. 1 Wible, Mountain View, Kern ...	23-30-29	4,576	sd. sh. drlg.
Allied Pet., No. 33 Allied, Mountain View, Kern ..	19-30-29	1,946	fish D.P.
Texas, No. 2 Jewett, Arvin, Kern	16-31-29	6,482	recmtd. 6,385
Standard Oil, No. 5 Jewett, Arvin, Kern	16-31-29	6,090	flow 1,135 b.d.
Richfield Oil Corp., No. 2 Mott, Arvin, Kern	9-31-29	5,150	sd. sh. drlg.
Morton, L. C., No. 1 Barlow Farms, Arvin, Kern ..	25-31-29	4,499	sd. sh. drlg.
Meridian Pet. Corp., No. 2 Deep Test, Fruitvale, K.	23-29-27	8,531	basement
Union Oil, No. 4-23 Bowerbank, Goose Lake, Kern	25-29-24	10,140	redrlg. 9,965
Union Oil, No. 41-34, KCL, Rio Bravo, Kern.....	34-28-25	9,763	sd. sh. drlg.
Superior Oil, No. 1 Smith, Rio Bravo, Kern	34-28-25	3,984	sd. sh. drlg.
Superior Oil, No. 1 Weber, Rio Bravo, Kern	27-28-25	9,672	sd. sh. drlg.
Standard Oil, No. 1 Ross, Greeley, Kern	20-29-26	10,580	sd. sh. drlg.
Standard Oil, No. 11-20, KCL, Greeley, Kern.....	18-29-26	9,797	sd. sh. drlg.
Standard Oil, No. 11-21, KCL, Greeley, Kern	18-29-26	8,582	sd. sh. drlg.
Standard Oil, No. 12-5, KCL, NW Greeley, Kern ..	7-29-26	10,121	gr. sd. drlg.
General Pet. Corp., No. 1 Sullivan, NE Greeley, K.	12-29-26	11,070	hd. sh. drlg.
Continental Oil, No. 2-D, KCL, Bellevue, Kern.....	14-30-26	13,980	hd. sh. drlg.
Shell Oil, No. 72-25-A, KCL, Ten Section, Kern....	25-30-25	8,200	flwd. 2,822 b.d.
Shell Oil, No. 21-28-B, KCL, Ten Section, Kern....	28-30-26	3,967	sd. sh. drlg.
Tide Water A. O., No. 46-7-E, KCL, Strand, Kern..	7-30-26	8,372	O.S. drlg.
Shell Oil, No. 75-12-B, KCL, Strand, Kern	12-30-25	7,830	sd. sh. drlg.
Ohio Oil, No. 15-E, KCL, Canal, Kern	14-30-25	6,994	sd. sh. drlg.
Shell Oil, No. 6-14-A, KCL, Canal, Kern	14-30-25	4,960	sd. sh. drlg.
Richfield Oil Corp., No. 12-33-A, KCL, Tupman, K.	33-30-25	9,331	P.B. 9,040
Richfield Oil Corp., No. 41-32-A, KCL, Tupman, K.	32-30-25	3,385	sd. sh. drlg.
Richfield Oil Corp., No. 67-4-B, KCL, Cole's Lv., K.	4-31-25	8,967	O.S. drlg.
Richfield Oil Corp., No. 76-4-B, KCL, Cole's Lv., K.	4-31-25	8,384	sd. sh. drlg.
Standard Oil, No. 20-2, KCL, Cole's Levee, Kern..	9-31-25	8,660	sd. sh. drlg.
Standard Oil, No. 20-3, KCL, Cole's Levee, Kern..	9-31-25	8,582	sd. sh. drlg.
Standard Oil, No. 20-4, KCL, Cole's Levee, Kern..	9-31-25	8,505	O.S. drlg.
Ohio Oil, No. 4-F, KCL, Cole's Levee, Kern.....	11-31-25	9,090	sd. sh. drlg.
Ohio Oil, No. 5-F, KCL, Cole's Levee, Kern.....	10-31-25	8,770	sd. sh. drlg.
Tide Water A. O., No. 81, KCL, Cole's Levee, Kern	14-31-25	10,120	cleaning out
Union Oil, No. 58-11, KCL, Cole's Levee, Kern ...	11-31-25	10,152	sd. sh. drlg.
Baker & Sonne, No. 1 Leyse, Midway-Sunset, Kern	20-32-23	2,730	redrlg. 2,510
Quality Oil, No. 6 W.P., Midway-Sunset, Kern ..	27-32-23	1,941	bailing
Merritt-Annex Oil, No. 8 Fried, Midway-Sunset, K.	25-12-24	2,494	completing
General Pet. Corp., No. 1 B.V.A., Midway-Sunset, K.	1-31-24	9,900	hd. sh. drlg.
Signal O. & G., No. 6 Kendon, Midway-Sunset, Ker.	35-32-23	1,382	sd. sh. drlg.
Shell Oil, No. 35-9 B.V.A., Midway-Sunset, Kern ..	9-32-25	9,091	sd. sh. drlg.
National Oil, No. 34 Sunset, Midway-Sunset, Kern	35-32-23	1,084	sd. sh. drlg.
Ohio Oil, No. 43-3-B, KCL, Paloma, Kern	3-32-26	4,277	sd. sh. drlg.
Western Gulf Oil, No. 74-3-A, KCL, Paloma, Kern	3-32-26	3,368	sd. sh. drlg.
Richfield Oil Corp., No. 81-36 B.V.A., B.V.L., Kern	36-31-25	7,592	sd. sh. drlg.
Continental Oil, No. 1-F, KCL, San Emidio, Kern..	5-10-21	9,102	gr. sd. drlg.
Bannow, L. E., No. 1 Irwin, San Emidio, Kern ...	15-10-23	1,126	will abd.
Shell Oil, No. 52-2-13-A, KCL, San Emidio, Kern.	13-11-22	11,503	hd. sh. drlg.
Par Pet., No. 1 Line, Antelope Valley, Kern	32-25-17	2,660	sd. sh. drlg.
Standard Oil, No. 51-19-B fee, NE Coalinga, Fresno	19-19-16	1,166	sd. sh. drlg.
Union Oil, No. 57-18 Cook, NE Coalinga, Fresno .	18-19-16	4,282	sd. sh. drlg.
Amerada Pet. Corp., No. 3-17 S.P.L., NE Coal., Fre.	17-19-16	4,488	sd. sh. drlg.
Superior Oil, No. 1 Husong, NE Coalinga, Fresno .	18-19-16	5,161	sd. sh. drlg.
Wilshire Annex Oil, No. 64-30-B, C Coalinga, Fresn.	30-19-16	8,372	fishing
Lytle, R. S., Agent, No. 53-7-F, SE Coalinga, Fresno	7-20-16	3,391	sd. sh. drlg.
Lytle, R. S., Agent, No. 64-7-F, SE Coalinga, Fresno	7-20-16	6,398	sd. sh. drlg.
Lytle, R. S., Agent, No. 28-18-F, SE Coalinga, Fres.	18-20-16	7,540	O.S. drlg.
Universal Cons'd. Oil, No. 81-24-C, SE Coal., Fresno	24-20-15	3,074	sd. sh. drlg.
Texas, No. 3 Exeter fee, SE Coalinga, Fresno	6-20-16	7,570	sd. sh. drlg.
Standard Oil, No. 62-13-C fee, SE Coalinga, Fresno	13-20-15	6,322	sd. sh. drlg.
Standard Oil, No. 75-13-C fee, SE Coalinga, Fresno	13-20-15	3,974	sd. sh. drlg.
Superior Oil, No. 5 fee, SE Coalinga, Fresno	7-20-16	7,960	hd. sh. drlg.
Superior Oil, No. 4 Huffman, Kettleman N., Fresno	29-21-17	8,730	sd. sh. drlg.
K. N. D. A., No. 25-22-Q, Kettleman North, Kings .	22-22-18	7,141	sd. sh. drlg.
K. N. D. A., No. 38-22-Q, Kettleman North, Kings .	22-22-18	5,752	sd. sh. drlg.
K. N. D. A., No. 56-22-Q, Kettleman North, Kings..	22-22-18	4,797	sd. sh. drlg.
K. N. D. A., No. 25-26-Q, Kettleman North, Kings..	26-22-18	7,920	completing
K. N. D. A., No. 47-26-Q, Kettleman North, Kings .	26-22-18	5,996	sd. sh. drlg.
K. N. D. A., No. 41-28-Q, Kettleman North, Kings .	28-22-18	6,843	br. sh. drlg.
Standard Oil, No. 2-19-J, Kettleman North, Fresno	19-21-17	10,940	gr. sd. drlg.
Standard Oil, No. 27-19-J, Kettleman North, Fresno	19-21-17	9,430	gr. sh. drlg.
Standard Oil, No. 72-19-J, Kettleman North, Fresno	19-21-17	9,421	sd. sh. drlg.
Standard Oil, No. 27-7-Q, Kettleman North, Kings .	7-22-18	9,130	fish D.P.
Standard Oil, No. 43-7-Q, Kettleman North, Kings .	7-22-18	8,340	sd. sh. drlg.
Standard Oil, No. 54-7-Q, Kettleman North, Kings .	7-22-18	2,987	sd. sh. drlg.
Standard Oil, No. 63-7-Q, Kettleman North, Kings .	7-22-18	2,872	sd. sh. drlg.
Standard Oil, No. 32-17-Q, Kettleman North, Kings	17-22-18	5,260	sd. sh. drlg.
Standard Oil, No. 63-17-Q, Kettleman North, Kings	17-22-18	8,490	cleaning out
Standard Oil, No. 72-17-Q, Kettleman North, Kings	17-22-18	3,871	sd. sh. drlg.
Standard Oil, No. 52-21-Q, Kettleman North, Kings	21-22-18	5,466	sd. sh. drlg.
Standard Oil, No. 74-21-Q, Kettleman North, Kings	21-22-18	4,478	sd. sh. drlg.
Standard Oil, No. 85-21-Q, Kettleman North, Kings	21-22-18	7,441	sd. sh. drlg.
Standard Oil, No. 32-27-Q, Kettleman North, Kings	27-22-18	6,852	sd. sh. drlg.
Standard Oil, No. 61-27-Q, Kettleman North, Kings	27-22-18	8,413	completing
Compass Oil, No. 1 Points, Deer Creek, Tulare	8-23-26	1,396	sd. sh. drlg.
Newton, S. M., No. 1 Stafford, Panorama, San L. O.	18-31-21	5,660	sd. sh. drlg.
Priest Valley Pet., No. 1 Greve, Priest V., Monterey	22-20-12	822	sd. sh. drlg.
Texas, No. 1 Eureka, Eureka, Humboldt.....	21- 3- 1	5,067	may redrill
Seaboard Oil, No. 1 Howard, Bear Creek, Merced .	6- 8-11	121	sd. sh. drlg.
Consolidated Pet., No. 1 Ashurst, L. Pinos, S. Benito	11-17-11	646	sd. sh. drlg.

OKLAHOMA

Week Ending October 21

NORTHERN OKLAHOMA

Caddo County

Sinclair Prairie Oil Co. No. 1 Gorman. SW NW NW Sec. 1-16-13w. S. heavy oil; cd. 6,442-49 ft.: Wdfrd. 6,600 ft.; drlg. Wdfd. sh. 7,033 ft.

Canadian County

W. R. Ramsey's No. 1 Mansfield. C NW NE Sec. 16-14-9w. Lytn. 6,250-80 ft., N.S.; drlg. 7,476 ft.

Cleveland County

Nels Burton No. 1 Boggs. NE NE SE Sec. 16-9-2w. 2nd Wlx. 7,585 ft.; T.D. 7,646 ft.; P.B. 7,473 ft.; shot and acd.; swbd. 47 B.O. and 50 B.W. in 16 hrs.

Nels-Burton No. 1 Hirsch, NW NW NE Sec. 17-9-2w O.W.P.B.; O.T.D. 7,692 ft.; T.D. 7,695 ft.; swbd. 250 B.F. in 24 hrs.; 10% B.S.

Sinclair-Prairie No. 1 Ward, SE SE SE Sec. 30-7-1. Hntn. 6,185 ft.; Vla. 6,408 ft.; open 30 min. at 6,800 ft., rec. S. W.; P.B. to 6,782 ft.; swb. 106 B.O. in 24 hrs.; hvy. blk. oil.

Comanche County

Mid Night Oil No. 1 Howe, NW NW NE Sec. 30-2-13w. O.W.D.D.; O.T.D. 703 ft.; drlg. 958 ft.

Creek County

Sunray Oil Co. No. 1 Harris, SW SW NE Sec. 30-14-7. T.D. 2,927 ft.; est. 370,000 cu. ft. gas.

Garvin County

Duckworth & Jennings' No. 1 Bowie, NW NE SE Sec. 3-4-3. W.O.C. 60 ft.

Robinson & Midco's No. 1 Clay, SW SW NW Sec. 21-4-3. Drlg. 2,756 ft.

Grady County

Alma Oil Co.'s No. 5 Pettit (O.W.D.D., SE SE SE Sec. 11-4-8w. Drlg. 2,970 ft.

Sinclair Prairie's No. 4 Charleston, NE NE SE Sec. 27-5-8w (O.W.D.D.); gas 3,330-50 ft.; drlg. sh. 3,876 ft.

Grant County

Magnolia Pet. Co.'s No. 1 Margay-Johnson, SW SW NE Sec. 29-25-8w. Drlg. Miss. 6,033 ft.

Greer County

Butler's No. 1-A Meyers, NE SE NW Sec. 25-7-21w. Drlg. 896 ft.

Jackson County

English Drlg. Co.'s No. 1 Aetna Life, SE SE NE Sec. 26-3-20w. Gr. wsh. 1,034 ft. and S.G.; T.D. 1,225 ft.

Bob Helton et al's No. 1 Lee, NE SE NW Sec. 36-2-19w. Drlg. 200 ft.

Jefferson County

H. M. Weir No. 1 Carmichael, NE NE SW Sec. 23-7s-7w. Drlg. 3,525 ft.

Kingfisher County

Anderson-Prichard No. 1 Geis, C NE SW Sec. 15-18-9w. Lytn. 6,450-6,510 ft.; drlg. hd. L. 8,231 ft.

Ace Gutowsky No. 1 Lankford, NE NE SE Sec. 34-17-6w. Miss. 7,014 ft.; Woodford 7,531 ft.; Manr. 7,562 ft.; Wlx. 8,105 ft.; 2nd Wlx. 8,275 ft.; T.D. 8,330 ft.; S.D.O.

Kiowa County

Bollen-Dillard & Roberts No. 1 Holcomb, NE NE SW Sec. 25-7-19w. T.D. 1,400 ft.; rmg. to run 5-in.

Frank Dillard et al's No. 1 Hobbs, SE SE NW Sec. 35-6-17w. Gr. wsh. 555 ft.; drlg. 593 ft.

Hagerling et al No. 1 Bozeman, SE SE NE Sec. 14-5-18w. Drlg. 1,286 ft.

C. J. Hagerling No. 1 Kimray, SW SW NW Sec. 36-5-18w. Drlg. 1,500 ft.

Lincoln County

Black Gold No. 1 Locquchment, NE NE NE Sec. 28-14-6. T.D. 3,175 ft.; est. 5 B.O.P.D.; S.D.

R. L. Kemp's No. 1-A Burke, NE SW NE Sec. 20-17-6. Prue 2,864-2,908 ft., T.D.; swbg. through tbg.; 900 lb. C.P.; will not flow.

Summitt Drlg. Co.'s No. 1 Percival, SE SE SE Sec. 24-12-3. Drlg. 2,780 ft.

McIntosh County

Scruggs et al's No. 1 Lanning, SE SW SW Sec. 19-12-15. Wlx. 3,515 ft.; T.D. 3,540 ft.; H.F.W.; D.&A.

Noble County

Franks & Ellis' No. 1 Stranka, SW SW NW Sec. 35-24-1w. S.D. 1,180 ft.

Oklahoma County

Hall & Briscoe No. 1 Thompson, SW SW NE Sec. 28-13-1. S.O. 4,803-27 ft.; T.D. 6,058 ft.; P.B. 5,185 ft.; C.O. to 4,850 ft.; to perf.

Osage County

Midco Oil Co.'s No. 1 Osage, NE NE SW Sec. 17-22-8. S.D. 2,847 ft.

Pawnee County

Ed Kelly No. 1 Hill, SW SW SE Sec. 1-21-5. Drlg. 3,250 ft.

Payne County

C. R. Hoagland No. 1 Stanolind, SE SE SW Sec. 27-18-4. Miss. 3,800 ft.; T.D. 3,905 ft.; D.P. stk.

C. F. Newsom's No. 1 Jones, NE NE SW Sec. 15-18-3. Miss. 4,019 ft.; T.D. 4,033 ft.; pipe stk.

Pontotoc County

C. C. Marchant's No. 1 Phillips, C W½ SW NE Sec. 8-4-5. S.O. 2,040 ft.; T.D.; D.&A.

Simpson-Roodhouse's No. 1 McKay, SW SW NE Sec. 1-2-7. D.S.T. 2,750-89 ft.; rec. 30 ft. mud and S.S.O.; cd. 2,854-59 ft., T.D.; N.S.; D.&A.

Pottawatomie County

Neustadt et al No. 1 Howeth, NE SE NE Sec. 14-6-4. Sd. and S.S.O. 3,455-60 ft.; S.D. 5,060 ft.

Sequoyah County

Thompson Bros. No. 1 Ruby, NW NW NE Sec. 30-12-22. Hntn. 1,451 ft.; T.D. 1,912 ft. (cor.); S.D.

Washita County

Continental Oil Co. No. 1 Proctor, C NW Sec. 28-10-20w. T.D. 14,540 ft.; drlg. out cmt.

SOUTHERN OKLAHOMA

Choctaw County

Letchfield & Kirksly No. 1 Schuester, SW SE SW Sec. 13-6s-14. Cd. 1,169-81 ft., L.&sd.; S.D. 1,184 ft. for core bbl.

Clyde Ross et al No. 1 Hardy, SE SE NW Sec. 21-7s-15. T.D. 1,634 ft.; W.O.C.

Jefferson County

Fred Land et al's No. 1 Barrett, NE SE SE Sec. 14-6s-6w. Sd. 1,852 ft., S.O.; D. P. stk. at 1,100 ft.; T.D. 1,890 ft.

Love County

Neff et al's No. 1 Brahma, NW NW SW Sec. 35-6s-2e. S.S.O. 1,555-90 ft.; drlg. 2,620 ft.

Marshall County

Hughes et al No. 1 Vittitto, C NE SE Sec. 11-5s-4e. O.W.D.D.; O.T.D. 7,100 ft.; T.D. 7,110 ft.; S.D.

Johnson et al No. 1 Godfrey, SW SE NE Sec. 14-6s-6e. Vla. 2,627 ft; S.S.O.; drlg. 2,759 ft.

KANSAS

Week Ending October 21 (Descriptions are East unless marked otherwise)

Barton County

C. E. Ash et al's No. 1 Montgomery, NW NW NW Sec. 11-16-11w. Drlg. 370 ft.

Aylward Prod. et al's No. 1 Harzman, C W½ NW SW Sec. 33-16s-11w. Lans. 3,056 ft.; Arb. 3,350-56 ft., T.D.; S.S. O.; W.O.C.

B. B. & M. Drlg. Co.'s No. 1 Krier. CEL SE SE Sec. 30-16-11w. Drlg. 2,170 ft.

Crown Pet. Co. No. 1 Marchand, NE SE NW Sec. 13-20-11w. Drlg. 2,910 ft.

Seaney & Clampitt's No. 1 Schauf, CSL E½ SW Sec. 1-16-12w. Lans. 3,051 ft.; S.S.O. and wtr. in core 3,142-56 ft.; Arb. 3,358-91 ft., T.D.; rng. csg.

Butler County

Allison & Talbott's No. 1 Zink, SE SE NE Sec. 32-29-5. C.O. 755 ft.

Carey & Jennings No. 1 Kelly, C SW Sec. 20-27-4. S.D. 2,660 ft.

Cromwell & Lewis No. 1 Stern, NW NW NW Sec. 27-27-6e. M.I.M.

Marylyn Oil et al No. 1-A Hoard. SW NE NE Sec. 28-29-8. Lans. 1,625 ft.; S.S.O. 2,095 ft.; S.O. 2,355-60 ft.; Miss. 2,836-41 ft., T.D.; W.O.C.

Coffey County

Hollett's No. 1 Butler. SE SW SE Sec. 28-20-15. Rng. 8-in. 709 ft.

Cowley County

Garden's No. 1 Rahn, SW SW NW Sec. 13-34-5. Bart. 2,936 ft.; 200 ft. O.I.H.; C.O.

E. B. Shawyer's No. 1 Henderson. C W½ NE NE Sec. 4-33-6. Drlg. 2,090 ft.

Gerald Smith et al's No. 1-B Haney, CEL NW SW Sec. 9-33-6. Drlg. 3,378 ft.

Dickinson County

Franks et al No. 1 Huffman, NW NW SW Sec. 11-13-1. Hntn. 2,807 ft.; Vla 3,048-55 ft.; S.S.O. 3,156-65 ft.; base Vla. 3,218 ft.; H.F.W. 3,240 ft.; inc. wtr. 3,256 ft.; S.D.O. 3,266 ft.

Douglas County

Greenway Oil Co.'s No. 1 Grosdedier, C E½ SE NE Sec. 24-13-20. S.D. 470 ft.

Franklin County

Security O. & G. Co. No. 1 Teall, C SW NW Sec. 11-17-17. Rng. 8-in. 1,050 ft.

Greenwood County

Chas. Barker's No. 1 Gregg, SW NW SE Sec. 35-25-12. (O.W.D.D.). O.T.D. 1,660 ft.; drlg. 1,955 ft.

Henderson & Marcus' No. 1-A Smith, NW NW SE Sec. 8-24-11. Drlg. 1,655 ft.

A. A. Hinze et al's No. 1 Hester, NW SW NE Sec. 1-22-12. S.D. 510 ft.

Marylyn Oil Co.'s No. 1 Burke, NE NE SW Sec. 27-24-11. R.U. mch.

Lawrence Spencer's No. 1 Edwards, NW NW SW Sec. 32-24-12. Drlg. 1,325 ft.

Jefferson County

Continental Oil's No. 1 Berridge, NW NW SW Sec. 8-9-17. Miss. 2,040 ft; Hntn. 2,485 ft.; drlg. 2,685 ft.

E. W. Mosbacker et al's No. 1 McLaughlin. SW NE NW Sec. 4-10-20. S.D. 125 ft.

C. L. Sheedy et al's No. 1 O'Neill, SE SW NW Sec. 34-8-19. Drlg. below 2,350 ft.

Johnson County

F. O. McCain's No. 1 Lyons, NW SW NE Sec. 27-13-22. Miss. 900 ft.; T.D. 1,000 ft.; H.F.W.; D.&A.

Kingman County

Skelly Oil Co. No. 1 Miller, CSL N½ NE Sec. 31-27-10w. Set 7-in. 4,067 ft.; R.U. S.T.

Montgomery County

Lerke & Whorton No. 1 Clemmer, C SW SW Sec. 21-32-15. Arb. 1,530 ft.; set 5-in. csg.; W.O.C.

Osage County

J. M. Edwards No. 1 DeHick (O.W.D.D.), C NW SE Sec. 21-14-15. O.T.D. 1,200 ft.; S.G. in sh. 1,618-24 ft.; S.D. 1,650 ft.

Pratt County

Skelly Oil Co. No. 1 Royse, C SW Sec. 9-28-11w. Lans. 3,604 ft.; Vla. 4,246-49 ft.; T.D. 4,268 ft.; S.S.O.; 802,000 cu. ft. gas.

Rice County

Fred Jones et al No. 1 Benhke, NW SW NW Sec. 25-18-10w. S.O. 2,670-75 ft.; ga. 3,000,000 cu. ft. gas at 2,950 ft.; killed gas; S.S.O. 3,048 ft.; U.R. 8-in. at T.D. 3,050 ft.

Phoenix Drlg. No. 1 Linville, SW SW SE Sec. 4-20-10w. Simp. 3,375 ft.; Arb. 3,388 ft.; acd. and P. 30 B.O.P.D.

Saco Oil's No. 1 Habeger, SE SE SW Sec. 12-18-10w. Drlg. 438 ft.

Vickers Pet. Co. No. 1-A Rodenberg, CNL NW¼ Sec. 8-18-10w. Lans. 2,930 ft.; Arb. 3,265-81 ft., T.D. N.S.

Rooks County

Broadview Oil No. 1 Baxter, NE SW SW Sec. 35-8-16w. Lans. 3,180 ft.; S.S.O.; T.D. 3,263 ft.; P. 89 B.O. in 7 hrs.; pot. 269 B.O.P.D.

Russell County

Ray Shaffer et al's No. 1 Shaffer, NE NE SW Sec. 9-13-11w. Rng. csg. 565 ft.

Stafford County

Continental Oil Co. No. 1 Keller, SE SE SE Sec. 15-24-13w. S.O. 3,733-43 ft., cd. 4,111-16 ft. and rec. 5 ft. sat.; T.D 4,116 ft.; 3,900 ft. O.I.H.

Woodson County

Billerman et al's No. 1 Rauscher, CSL N½ NW Sec. 1-25-13. Drlg. 890 ft.

Bird, Hanley & Sheedy No. 1 Pingrey, C S½ SE Sec. 22-25-15. Spd.

Henderson & Keene's No. 2 Piper, NW NW SE Sec. 19-23-15. Drlg. 1,487 ft.

MISSOURI

Adair County

Etting et al's No. 1 Clark, NW NE SE Sec. 8-63-14w. T.D. 200 ft.; S.D.

Ward McGinnis' No. 1 Laughlin, SE SE SW Sec. 16-53-34w. Loc.

Andrew County

Davis Bros. et al No. 1 Gee, NW NW SE Sec. 28-60n-35w. S.O. in Bart. 998 ft.; S.O. 2,065-75 ft.; Vla. 2,381 ft.; S. D. 2,407 ft.

Bates County

Monarch Roy.'s No. 1 Lee, C SW SE Sec. 11-39-30w. S.O. 834-36 ft.; T.D. 1,446 ft. (cor.); S.D.

Bollinger County

Delmund Oil No. 1 Cooper, SE SE SE Sec. 14-29-9e. S.D. 1,780 ft.

Buchanan County

Miller et al's No. 1 Carrough, C SE SE Sec. 24-57-35w. T.D. 95 ft.; W.O. power.

Butler County

Coastal Pet. et al No. 1 Pierson, SW NE NW Sec. 27-22-6e. S.D. 149 ft. (cor.)

Charlton County

L. E. Mummert et al's No. 1 Rickert, NW NE SE Sec. 26-54-20w. Loc.

Clay County

Pabelo Dev. Co.'s No. 5-A Robb, NW NW SE Sec. 36-52-32. T.D. 600 ft., S.G.; S.D.O.

Clinton County

C. E. King et al's No. 1 Vanderau, SE NE SW Sec. 18-55-31w. T.D. 1,044 ft.; S.D.; repairs.

Daviess County

H. H. Francis' No. 1 Louis, SW NW SW Sec. 29-59-27w. Drlg. 730 ft.

DeKalb County

Geo. W. Moore No. 1 McQuate, NE SW SW Sec. 11-57n-31w. Miss. 1,075 ft.; S.D. csg. 1,500 ft.

Holt County

Brin & Nathan No. 1 Decker, C NW NW Sec. 1-61-38w. Drlg. below 793 ft.

Jackson County

Hulse & Christopher's No. 1 Wiston, NE NW SE Sec. 22-49-32w. S.D. 510 ft. to D.D.

Knox County

W. H. Oberithier et al's No. 1 Campbell, C NE Sec. 18-61-12w. C.&P.

Livingston County

Davis Bros. No. 1 Minning, SE SE NW Sec. 22-58-23w. Hntn. 783 ft.; Vla. 1,-194 ft.; St. Peter 1,215 ft.; T.D. 1,225 ft.; D.&A.

Mercer County

Geo. W. Moore No. 1 Moss, NW SW SE Sec. 30-65-24w. Hntn. 1,273 ft.; T.D. 1,869 ft.; fsg. 6-in.

Platte County

Roach et al's No. 1 Dillingham, NE SW Sec. 16-53-34w. Loc.

Putnam County

Benedum & Trees' No. 1 Cooley, SE SE NW Sec. 33-64-17w. T.D. 965 ft.; cmtg. to test.

Randolph County

A. A. Ash et al's No. 1 Alexander, C SE Sec. 14-55-13w. Loc.

Ray County

Loomis-Jordan No. 1 Macey, NE SW NW Sec. 10-53-27w. S.O. 330 ft., T.D.; set csg.

Schuyler County

T. E. Baldwin No. 1 May Johnson, NW NE NE Sec. 21-65-15w. Lost hole; T.D. 322 ft.; abd.

T. E. Baldwin's No. 1-A Johnson, NW NE NE Sec. 21-65-15w. Loc.

St. Charles County

Brooks et al's No. 1 Stewart, SE SE SE Sec. 4-46-2e. S.D.O. 507 ft.

ARKANSAS

Clark County

Coker Oil Corp.'s No. 1 H. C. and H. H. Cabe, 330 ft. NE cor. NW NE Sec. 3-10-21. Set 5⅞-in. csg. 244 ft.; reported S.O. 352 ft.; rng. csg.

W. S. King's No. 1 H. Ross, 640 ft. S, 359 ft. W, NE cor. S½ SW Sec. 3-10-21. S.D. 1,560 ft.

W. P. Wilson's No. 1 Hamilton & Mathews, C W½ NE NE Sec. 31-10s-20w. Run 10-in. csg. 41 ft.; T. Nac. 358 ft.; S.S.O.; reported S.O.&G. 437 ft.; drlg. gr. sh. 1,300 ft.

Columbia County

Ark. Fuel Oil Co.'s No. 1-A King, C SE SW Sec. 16-17-20. Drlg. rd.&gr. sh. 6,-035 ft.

Atlantic Ref. Co.'s No. 1 Pine Woods Lbr. Co., C SE NW Sec. 16-18-22. M.I. rig.

Atlantic Ref. Co.'s No. 1-B L. Spain, S½ NW SW Sec. 18-17-19. Drlg. rd.&gr. sh. 5,796 ft.

Lion Oil Ref. Co.'s No. 1 Warnock est., C NW NW Sec. 15-18-22. Drlg. 3,172 ft.

C. H. Murphy et al's No. 1 Murphy Ld. Co., C NW NE Sec. 14-18-19. M.I. rig.

Normandie Oil Co.'s No. 2 Dees, C SE SE Sec. 24-17-20. Set whpstk. 5,300 ft.; O.T.D. 5,738 ft.; P.B. 4,500 ft.; drld. out and set whpstk. 4,636 ft.; set whpstk. 4,678 ft.; drlg. rd.&gr. sh. 5,-447 ft.

Shell Oil Co., Inc.'s No. 2 Merritt, C NW SW Sec. 15-17-20. Drlg. 3,220 ft.

Southwood Oil Co.'s No. 1-C A. L. Poindexter, C N½ SW SE Sec. 23-17-20. Whpstkd. 4,758 ft.; cg. 7,620 ft.

Standard Oil No. 1 J. A. Foster, Sec. 19-17s-19w. Set 8-in. csg. 7,453 ft.; set 370 ft. of 4½-in. at 7,594 ft.; set whpk. 4,340 ft.; set 6-in. csg. 7,481 ft.; T.D. 7,594 ft.; W.O.C.

Standard Oil Co. of La.'s No. 1-B Gunnels, 571 ft. W, 585 ft. S, NE cor. NW SW Sec. 19-17-19. Drlg. sd.&sh. 5,523 ft.

Standard Oil Co. of La.'s No. 1 Oda Jameson et al, 660 ft. N, 664 ft. W, SE cor. Sec. 14-17-19. Drlg. sd.&sh. 2,-540 ft.

Standard Oil Co. of La.'s No. 1 D. H. Lewis, C NW NE Sec. 19-17-19. T.D. 7,595 ft.; set 6-in. csg. 7,590 ft.; W. O.C.

Standard Oil Co. of La.'s No. 1 Petty Stave, C SE SE Sec. 4-17-21. Drlg. sh. 2,845 ft.

Standard Oil Co. of La.'s No. 1 R. S. Warnock, C NW NW Sec. 36-16-20. Spd. in.

Tide Water Seaboard's No. 1 Clark, C SE NE Sec. 16-18-19. Set 10¾-in. csg. 2,-514 ft.; drlg. rd.&gr. sh. 5,620 ft.

G. H. Vaughn and Deep Rock Oil Corp.'s No. 1 J. Jones unit, C SW NE Sec. 21-17-20. Set whpstk. 3,640 ft.; drld. to 4,678 ft.; hole 4° off; abd. loc. and skd. rig to C SW NE and drlg. 3,425 ft.

Craighead County

Tennark, Inc., No. 1 R. M. Martin, SE cor. NE NE Sec. 35-14-3e. Drlg. sdy. L. 3,-462 ft.; T. sdy. L. 3,458 ft.; drlg. hd. gr. L. 3,800 ft.

Lafayette County

East Texas Ref. Co.'s No. 2-A Patton, 373 ft. S, 652 ft. E, NW cor. NW SE Sec. 24-16-24. R.U.

Standard Oil Co. of La.'s No. 2 H. B. Eddy et al, C SE SE Sec. 12-16-23. Drlg. L.&sh. 4,950 ft.

Lonoke County

W. L. Tedford No. 1 Anderson, Sec. 7-4n-9w. Set 6¼-in. csg. 1,025 ft.; reseating 6-in. csg. to S.O.W. 1,125 ft.; U.R. 6¼-in. csg. 1,175 ft.; reported S. O. 940 ft.; S.D. 1,500 ft.

Miller County

W. C. Feazel's No. 1 Norton, 454 ft. N, 350 ft. W, SE cor. Sec. 18-20-27. Set 5½-in. csg. 6,029 ft.; T.D. 6,102 ft.; W.O.C.

Nevada County

Berry Asphalt Co.'s No. 1 Calloway-Howell, 175 ft. W, 220 ft. S, NE cor. NE SW Sec. 5-14s-20w. Prep. run 7-in. csg. 1,189 ft.

O. T. Clark's No. 1 T. M. Bemis, 330 ft. NW cor. NW NE Sec. 23-10s-22. M. I.M.

Ouachita County

A. B. Turner et al No. 1 Cook Est., C NW SW Sec. 27-15-18. W.O. 1,618 ft.

Pulaski County

Coker Oil Corp.'s No. 1 Huffman, 330 ft. NW cor. NW SW SW Sec. 29-4n-11w. 8⅝-in. csg. 206 ft.; S.D. 1,763 ft.

Sevier County

R. A. McArthur's No. 1 Bell est., 20 ft. SE cor. SE SW Sec. 29-9s-32w. Set 12½-in. csg. 100 ft.; S.D. 165 ft.

Union County—Schuler

Lion Oil Ref. Co.'s No. 2 Calloway, 330 ft. SE cor. SE SE Sec. 13-18-18. Set 7-in. csg. 7,635 ft.; T.D. 7,645 ft.; perf. 7,560-78 ft.; swbd. S.W.; set retainer 7,550 ft. and sqzd.

Lion Oil Ref. Co.'s No. 7-B Morgan, 330 ft. NW cor. W½ SE Sec. 18-18-17. Drlg. rd. sdy. sh. 6,064 ft.

Marine Oil Co.'s No. 5 Justiss, 300 ft. N, 465 ft. W, SE cor., Lot 7, NW Sec. 18-18-17. Set 10¾-in. csg. 822 ft.; cg. 5,-745 ft.

Union County—Other

E. G. Bradham's No. 4-A H. C. McKinney, 306 ft. N, 660 ft. E, SW cor. SW SW Sec. 30-17-15. Hole 120° off; P.B. 2,150 ft.; hole 11° off; abd. and skd. 20 ft. N; set 10-in. csg. 100 ft.; T.D. 2,167 ft.; set 7-in. csg. 2,167 ft.; W.O.C.

Crestrock Oil Co.'s No. 1 E. Riley, 330 ft. S, 250 ft. W, NE cor. NW SW Sec. 9-16-15. S.O. 2,370-80 ft. and 2,-390-2,400 ft.; 6-in. csg. 2,415 ft.; T.D 2,415 ft.; perf. 2,370-74 ft.; pmpd. est. 200 B.P.D.; small S.O.; pmpd. 300 B.F. in 8 hrs., 8% oil; W.O.

Delta Drlg. Co. et al's No. 1 J. E. Bull, 330 ft. SE cor. SW NW Sec. 6-18-13. Drlg. 1,120 ft.

Delta Drlg. Co.'s No. 1 C. T. Grace, C SE SE Sec. 31-12-14. Set 10¾-in. csg. 815 ft.; cd. sd. S.O. 3,522-42 ft.; D.S.T. 15 min.; ¾-in. cks.; W.P. 11 lb.; tstd. 2,700 ft. S.W.; cd. S.O. 4,609-29 ft. and 4,629-49 ft.

Lion Oil Ref. Co. No. 9-A Hays, Sec. 4-16-15. O.W.W.O.; O.T.D. 7,255 ft.; P.B 2,325 ft.; rpd. csg. 2,276-80 ft.; S.O.; pmpd. est. 700 B.P.D. S.W.; S.S.O.; arng. recmt. 2,325 ft.; W.O.C.

Oil Prod., Inc.'s No. 1 Moore, C SE SE Sec. 1-17s-14w. Cg. 2,974 ft.

Jo-Mo Oil Corp.'s No. 1 Union Sawmill Co., 330 ft. N and W, SE cor. NE NE Sec. 24-17-14. Set 10-in. 74 ft.; T. Nach. 2,310 ft.; drlg. 4,674 ft.

ALABAMA

Barbour County

W. B. Hinton's No. 1 fee, Sec. 14-9n-26e. Drlg. sd.&sh. 5,112 ft.

Choctaw County

Joe Modisett et al's No. 1 McCorvey, SE cor., SW SW Sec. 20-9n-2w. S.D. 7,-520 ft.

Houston County

Columbia Oil Co.'s No. 1 State Ld., SE cor. NE NE Sec. 8-2n-29e. S.D. 2,150 ft.; Selma clk.

Lawrence County

Mid-Southern Pet. Co.'s No. 1 W. R. Jackson, 150 ft. NL, 500 ft. EL, Sec. 30-7-6. S.D. 570 ft., hd. L.

Washington County

Texon Drlg. Co.'s No. 1 Stallworth Naval Stores, Sec. 25-5n-4w. Spd.; set 12-in. csg. 147 ft.; S.D. 2,776 ft.

MISSISSIPPI

Claiborne County

Claiborne Co. Dev. Co. No. 1 Ruth Hayden, S½ SE Sec. 55-11n-2e. O.W.WO., O.T.D. 2,949 ft.; S.D. 3,272 ft., sh.

Copiah County

Triangle Drlg. Co.'s No. 1 W. W Broome, 153 ft. SW cor. SW SE Sec. 1-10n-8e. T.D. 10 ft.; spd.; S.D.; W.O. heavy rig.

Harrison County

Big Ridge Oil Co.'s No. 1 Hengin, C NE Sec. 13-7s-10w. S.D. 2,700 ft.

Hinds County

G. Jefferies' No. 1 Gaddis-McLaurin, 150 ft. E, 274 ft. S, NW cor. SW Sec. 17-7n-2w. Spd.

Love Pet. Co.'s No. 1 Kennington Inv. Co., 82 ft. E, 120 ft. N, SW cor. Lot 19, Kenwood subd. Part 2, Sec. 35-6n-1e. Cg. sh. 2,300 ft.

G. Jefferies' No. 1 Gaddis-McLaurin, 150 ft. E, 274 ft. S, NW cor. SW Sec. 17-7n-2w. T.D. 900 ft.; run 10-in. csg.

Itawamba County

G. C. Grasty et al's No. 1 Ky. Lbr. Co., 1,320 ft. E, 660 ft. S, C Sec. 7-10s-10e. Drlg. 50 ft.

Issaquena County

A. A. Chaney, Tr.'s No. 1 J. C. Mohanna, Sec. 13-18n-3e. Drk.

Kemper County

M. R. Crabb et al's No. 1 W. T. Caldwell, NW SE Sec. 25-9n-15w. 10¾-in. csg. 86 ft.; T.D. 1,200 ft.; wash. to bttm.

Lafayette County

Adam O. & G. Co. No. 1 Z. E. Lewellen, 990 ft. WL, 330 ft. NL, NE NW NW Sec. 9-10s-1w. T.D. 4,167 ft.; W.O.

Lamar County

Ira H. Larr et al's No. 1 M. Simmon, Sec. 32-3n-14w. Spd.

South Miss. Pet. Corp.'s No. 1 Pearly Morris, 500 ft. S, 570 ft. E, C Sec. 4-2n-14w. S.D. 3,029 ft.

Pike County

S. R. Crouch's No. 1 Cupit, 360 ft. N, 660 ft. W, SE cor. NE SW Sec. 25-2n-7e. S.D. 864 ft.

Prentiss County

Home Dev. Co.'s No. 1 Mrs. A. Allen Sec. 8-7s-9e. Drlg. dolo. 1,195 ft.

Simpson County

Cleve Love No. 1 N. E. Gardner, SW cor. SW NE Sec. 1-10n-17w. S.D. 3,150 ft., Wlx.

Yazoo County

O'Brien Bros. et al's No. 1 Jennie Stevens, C SW NE Sec. 13-10n-3w. Cd. brkn. por. sat. sd.&sh. 4,480-4,520 ft.; est. total 20 ft. sd. in Woodruff at 4,488-4,510 ft.; T.D. 4,520 ft.; W.O. csg.

Union Prod. Co.'s No. 1 S. E. Perry et al, C NW NW Sec. 24-10-3. T. Cretaceous 4,485 ft.; T.D. 4,603 ft.; 7-in. csg. 4,577 ft.; 4½-min. D.S.T. 4,562-4,603 ft. rec. 1,520 ft. P.L.O.

Union Prod. Co.'s No. 1 Stevens, C NW NW Sec. 13-10n-3w. T. Cretaceous 4,-395 ft.; rec. 4½ ft. shly. L.&sd. with O.S. 4,407-27 ft.; cd. sdy. sh. 4,670-4,770 ft.; slightly spotted shows of oil; cg. ahead at 4,780 ft.

LOUISIANA

N. LOUISIANA WILDCATS

Bossier Parish

Gary & Gibson's No. 1-A Connell, 270 ft. W, 96 ft. S, NE cor. N½ SE SE Sec. 15-19-11. Drlg. 20 ft.

Gulf Ref. Co.'s No. 20 C. B. Hodges, 3,-131 ft. N, 1,388 ft. W, SE cor. Sec. 24-16-12. T. Pett. L. 5,298 ft.; drlg. rd. &gr. sh. 5,860 ft.

Premier Inv. Co.'s No. 7-B Kendrick, 150 ft. N, 1,980 ft. W, SE cor. Sec. 22-19-11. Drlg. sd. 356 ft.

J. B. Stovall's No. 8 Ark. Fuel Oil fee, 350 ft. N, 4,400 ft. W, SE cor. NE SE Sec. 15-19-11. Drlg. 20 ft.

Caddo Parish

R. E. Allison's No. 3 Ellerbe et al, 330 ft. N, 1,980 ft. E, SW cor. Sec. 27-18-14. Drlg. L. 3,660 ft.

Ark. La. Gas Co.'s No. 1 Bell, 1,213 ft. N, 1,067 ft. E, SW cor. Sec. 6-17-16. Set 9⅝-in. csg. 3,246 ft.; drlg. sh.&L. 4,915 ft.

J. W. Bailey's No. 1 Winston, 592 ft. N, 150 ft. E, SW cor. NW Sec. 8-20-15. Set 10-in. csg. 110 ft.; 6-in. csg. 1,344 ft.; acdzd. with 3,000 gal.; tstg. 1,585 ft.

Burnham Drlg. Co.'s No. 1 Hurdle, 990 ft. N, 300 ft. E, SW cor. SE¼ Sec. 34-22-16. R.U.

Burnham Drlg. Co.'s No. 1 Wilkinson, 1,650 ft. N, 990 ft. W, SE cor. Sec. 33-22-16. Set 10-in. csg. 105 ft.

Burton & Harlan's No. 1 Thompson, 495 ft. S, 261 ft. E, C Sec. 1-20-16. Set 6⅝-in. csg. 1,316 ft.; used 4,000 gal. acd.; tstg. 1,552 ft.

David Crawford et al's No. 1 Lloyd, 3,-940 ft. N, 1,000 ft. E, SW cor. Sec. 29-17-13. T.D. 1,410 ft.; prep. run 9⅝-in. csg.; blew out in Nac. gas sd. at 900 ft. and caught fire; extinguished; built new drk.; prep. set 9⅝-in. csg. 1,400 ft.

L. I. Davis' No. 1 Williams, C NW NW Sec. 14-15-15. R.U.; S.D.

Homer Ferguson's No. 2 Pala, Sec. 1-20-16. Set 5⅞-in. csg. 1,346 ft.; drlg. plug 1,568 ft.

Ben F. French's No. 1 Greer, 220 ft. S, 450 ft. W, NE cor. Sec. 1-20-16. Set 6⅝-in. csg. 1,338 ft.; W.O.C.

R. L. Hall's No. 2 Caddo Lv. Bd., 585 ft. S, 1,245 ft. E, C Sec. 26-21-16. Set 8-in. csg. 938 ft.; T.D. 942 ft.; W.O.S.R.

A. R. Hancock's No. 7 Standard Oil Co. fee, 1,410 ft. E, 1,430 ft. N, C Sec. 18-21-15. Drlg. sh. 500 ft.

Jones Oil Co.'s No. 1 Pitts, 250 ft. S, 674 ft. W, NE cor. Sec. 24-20-16. Tstd. dry 1,679 ft., S.O.; acdzd. with 3,000 gal.; pmpg. S.W.

C. H. Lyons et al's No. 1 Rosenblath, 725 ft. N, 1,270 ft. E, C Sec. 35-18-14.

9-in. csg. 1,221 ft.; drlg. L.&sh. 3,606 ft.
D. R. Manziel's No. 1 Brooks, 338 ft. S, 250 ft. E, NW cor. Sec. 17-21-15. R.U.
J. F. Mechen's No. 1 Crystal, 990 ft. S, 900 ft. W, NE cor. Sec. 14-21-16. Set 6⅝-in. csg. 1,697 ft.; drlg. plug.
J. Ray Murray et al's No. 1 Standard Oil Co. fee, 330 ft. N, 200 ft. E, SW cor. Sec. 12-21-16. Set 7-in. csg. 1,500 ft.; acd. with 1,000 gal. at 1,720 ft.; S.O.; T.D. 2,312 ft.; set 5-in. csg. 2,255 ft.; tstg.; T.D. 2,312 ft.
G. H. Neighbors' No. 1 Thrash, 1,168 ft. N, 370 ft. E, SW cor. SE¼ Sec. 36-21-16. Tstd. dry; W.O. 1,590 ft.
Claude Nell's No. 1 Vaughn, 115 ft. S, 465 ft. W, NE cor. SW SE Sec. 1-20-16. S.D. 900 ft.
J. S. Pate's No. 1 J. B. Files, 330 ft. N, 332 ft. W, SE cor. Sec. 7-21-15. 6⅝-in. csg. 1,530 ft.; acdzd. with 4,000 gal.; W.O.S.R. 1,753 ft.
Seymour Oil Co. No. 1 Hughes et al, 330 ft. NE cor. NW Sec. 15-20-15. W.O. S.R.; set 6-in. csg. 2,190 ft.; T.D. 2,206 ft.
Stanolind O. & G. Co. No. 1, 131 Dillon hrs., C SE NE Sec. 14-21-15. Ran Schmb. 9,109 ft.; T. Smkvr. L. 8,952 ft.; drlg. sh.&stks. L. 9,545 ft.
Joe G. Strahan's No. 2-A Hart, 1,300 ft. N, 990 ft. E, SW cor. Sec. 29-21-16 S.D. 1,350 ft.; wtr.
Joe G. Strahan's No. 2 Stiles, 1,958 ft. N, 250 ft. E, SW cor. Sec. 29-21-16. Set 6-in. csg. 2,199 ft.; T.D. 2,400 ft.; W.O.S.R.
Temple Oil Co.'s No. 1 Bostwick, 990 ft. N, 330 ft. W, SE cor. SW Sec. 13-22-16. Drlg. sh. 1,520 ft.
Tippett Oil Corp.'s No. 2 Bell, 330 ft. NW cor. SW NW Sec. 34-22-16. S.D. for wtr. 1,608 ft.
Travis & Red Iron Drlg. Co.'s No. 1 Chandler et al, 819 ft. S, 2,086 ft. E, NW cor. Sec. 5-23-15. Set 9⅝-in. csg. 961 ft.; drlg. 970 ft.
Waldron & Barnes' No. 2 Ark. Fuel Oil Co., 483 ft. N, 630 ft. E, SW cor. NW SE Sec. 1-20-16. Set 5½-in. csg. 1,325 ft.; T.D. 1,572 ft.; acdzd. with 2,500 gal.; W.O.S.R.

Caldwell Parish

Critchett & Woods (formerly E. T. Oakes) No. 1 Kyles, NE cor. SW NE Sec. 18-11-3e. S.D. 4,552 ft.; rig repair.

Claiborne Parish

Lisbon Explin. Co. No. 1 Roberta Vaughn, 330 ft. N, 660 ft. E, SW cor. NW NE Sec. 36-21-5. O.W.D.D.; O.T.D. 5,313 ft.; recmtd. 7-in. csg. 5,343 ft.; T. Tr. Pk. 5,405 ft.; T. lower Marine form. 7,833 ft.; cd. 8,360-78 ft.; max. of 3½ ft. of por. gas sd.; drlg. ahead sd.&sh. 8,512 ft.

De Soto Parish

N. W. Hunter's No. 1 Anders-LeBlanc, C NW SE Sec. 5-11-14. Set 10-in. csg. 590 ft.; W.O.C.
Murray Davis' No. 1 Russell, 50 ft. N, 500 ft. W, SE cor. NE NW Sec. 12-11-16. D.S.T. 2,725-36 ft.; rec. 1,000 ft. S.W. in 33 min.; W.O.; T.D. 2,736 ft.
C. H. Tuttle No. 2-A Wemple, E NW cor. SW¼ Sec. 14-12n-11w. T. bkn. sd. 2,640 ft.; 6⅝-in. csg. 2,557 ft.; tstg. 2,698 ft.

Franklin Parish

Continental Oil Co.'s No. 1 J. T. Carroll et al, 330 ft. NW cor. Sec. 26-13-8e. Drlg. sh. 920 ft.

La Salle Parish

Smith Bros.' No. 1 Kenney, 660 ft. S, 150 ft. W, C Sec. 7-10-2e. T. sd. 1,517 ft.; set 8¼-in. csg. 1,517 ft.; T.D. 1,527 ft.; tstg. 1,527 ft.

Morehouse Parish

Southern Carbon Co.'s No. 26 Tensas, Sec. 2-21-4e. 6-in. csg. 2,150 ft.
Union Prod. Co. No. 1-A Tensas-Delta, 1,894 ft. W, 1,584 ft. S, NE cor. SE Sec. 8-22-4. Set 20-in. csg. 125 ft.; 16-in. csg. 712 ft.; set 10¾-in. csg. 2,448 ft.; drlg. 7,719 ft.

Natchitoches Parish

Jack Lent et al's No. 1 Walker, C NE NE Sec. 9-10-10. 10-in. csg. 63 ft.; drlg. sh. 1,632 ft.
Popkins & DeSoto Bros.' No. 1 Peavy-Wilson Lbr. Co., 330 ft. NW cor. SE NW Sec. 36-7n-9w. O.W.W.O.; O.T.D 500 ft.; S.D. 2,700 ft.

Sabine Parish

Ed Bailey's No. 1 Hale, 330 ft. NW cor. NE NW Sec. 6-7-12. S.D. for wtr. 1,228 ft.
A. R. Chestnut et al's No. 1 Sepulvedo, 990 ft. N, 330 ft. E, SW cor. Sec. 4-7-13. Drlg. sdy. sh. 1,290 ft.
M. Lanza's No. 1 Phares, 330 ft. SE cor. NE SE Sec. 5-5-12. Drlg. sh. 825 ft.
W. E. Manners' No. 1 Stephens, C SW SE Sec. 17-9-11. R.U.
Oglesby & Baird's No. 1 Sabine Lbr. Co., SW cor. SW SE Sec. 5-7-13. T. clk. 2,140 ft.; rng., csg.; T.D. 2,140 ft.
K. R. Phillips' No. 1 Craig, 335 ft. S, 330 ft. E, NW cor. NW SE Sec. 22-9-13. D.D.; arng. test; T.D. 1,935 ft.
W. L. Posey No. 1 Rivers, C NW NW Sec. 26-8-13. 6-in. csg. 2,147 ft.; T.D. 2,150 ft.; T. clk. 2,145 ft.; S.D. for wtr. 2,410 ft.
W. M. Quick No. 1 Sabine, SE cor. NE SE Sec. 8-7-13. 6-in. csg. 2,061 ft.; T. D. 3,547 ft.; P.B. 2,350 ft.; tstg. small S.O.&wtr.
H. M. Sneed No. 1 Leone, SW cor. NW SE Sec. 8-7-13. T.D. 1,962 ft.; 6-in. csg. 2,061 ft.; W.O.S.R.; T.D. 2,116 ft.
S. E. Stack's No. 1 Gray, 330 ft. SW cor. Sec. 4-7-13. T. clk. 2,025 ft.; set 7-in. csg. 2,028 ft.; W.O. wtr.
J. E. Stack's No. 1 Weber, 330 ft. SE cor. SW NE Sec. 8-7-13. R.U.; S.D.
Sutton-Zwolle Oil Co.'s No. 3 Sabine, 1,650 ft. S, 660 ft. E, NW cor. NE Sec. 23-7-14. S.D.

Union Parish

W. E. Hope O. & G. Co.'s No. 6 Frost Lbr. Ind., Sec. 26-22-3. R.U.
Memphis Nat. Gas Co.'s No. 3 Lankford, 1,980 ft. S, 660 ft. E, NW cor. Sec. 7-22-4. Set 6-in. csg. 2,108 ft.; W.O.C.
Southern Carbon Co.'s No. 33 Grayling, Sec. 30-22-4e. Set 12-in. csg. 145 ft.; W.O.C.
H. L. Woods' No. 1 Frost Lbr. Ind., 1,980 ft. E, 660 ft. N, SW cor. Sec. 29-21-3. Set 8-in. csg. 769 ft.; W.O.C.
H. L. Woods' No. 1 Union Power, 1,980 ft. E, 660 ft. S, NW cor. Sec. 29-21-3. R.U.

Webster Parish

Geo. B. Barham's No. 1 Bodcaw Lbr. Co., 627 ft. N, 710 ft. E, SW cor. SE Sec. 15-21-10. O.W.D.D.; O.T.D. 4,683 ft.; cor. T. Hillwy. sd. 5,832 ft.; T.D. 5,860 ft.; tstg.
Magnolia Pet. Co.'s No. 3 Cox, 672 ft. W, 737 ft. N, SE cor. SE NE Sec. 22-21-10. Drlg. L.&sh. 3,250 ft.
Midstates Oil Corp.'s No. 1 W. L. Coyle, 100 ft. NW, C NE SE Sec. 20-21-10. D sd. 8,526-46 ft. (oil); cg. 8,665 ft.
Oliphant Oil Co.'s No. 2 Bank, 410 ft. S, 660 ft. E, NW cor. Sec. 2-20-10. Drlg. sh.&L. 5,705 ft.
Stanolind O. & G. Co.'s No. 4 Pardee, 660 ft. SE cor. Sec. 25-21-10. T. Tr. Pk. 5,829 ft.; 9⅝-in. csg. 5,950 ft.; drlg. 5,829 ft.; 9⅝-in. csg. 5,950 ft.; 9⅝-in. csg. 5,863 ft.; drlg. sh.&sd. 6,943 ft.
Woodley Pet. Co.'s No. 2 Couch, 810 ft. S, 510 ft. W, NE cor. SW Sec. 35-21-10. 13⅜-in. csg. 683 ft.; set 9⅝-in. csg. 5,775 ft.; W.O.C.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co. No. 3 Brookshire, Sec. 66-12s-3e. T.D. 7,896 ft.; 6-in. csg. 7,896 ft.; perf. csg. 7,886-80 ft.; tstg.
Continental Oil Co. No. 1 David Meaux, Sec. 9-12s-3e. T.D. 11,359 ft.; T. gas sd. 11,318 ft.; D.S. stk.; fsg.
Continental Oil Co. No. 1 Franciel, Sec. 67-12s-3e. Drlg.
Stanolind O. & G. Co.'s No. 1 Lebocut, Sec. 33-12s-3e. Loc.

Bancroft—Beauregard Parish

Republic Prod. Co.'s No. 9 Columbia Ld. & Tmbr. Co., Sec. 15-6s-13w. T.D. 7,330 ft.
Republic Prod. Co.'s No. 11 Columbia Ld. & Tmbr. Co., Sec. 16-6s-13w. T.D. 7,321 ft.; 5½-in. csg. 7,316 ft.
Republic Prod. Co. No. 9 Lutcher Moore, Sec. 15-6s-13w. T.D. 11,018 ft.; 5½-in. csg. 11,018 ft.; perf. csg. 10,375-85 ft.; tstd. S.W.; sqzd. perf.; P.B. to 8,420 ft.; abd.
Republic Prod. Co.'s No. 1 G. T. Whitman, Sec. 15-6s-13w. R.U.

Bateman Lake—St. Mary Parish

Texas Co. No. 1 St. Mary Parish Sch. Bd., Sec. 16-16s-12e. Drlg. sh. 11,082 ft.

Baton Rouge—East Baton Rouge Parish

W. V. Bowles' No. 2 Richard Community, Sec. 45-7s-1e. T.D. 6,522 ft.; 5½-in. csg. 6,522 ft.
M. T. Grubb et al's No. 2 College Town Sec., Lot 18, Blk. 2. T.D. 6,493 ft.; 7-in. csg. 6,484 ft.
Guaranty Oil Co. No. 2 Morgan, Sec. 65-7s-1w. T.D. 6,530 ft.; 5½-in. csg. 6,450 ft.; swbd. S.W.; S.D.
Wm. Helis' No. 3-B Duplantier, Sec. 68-7s-1w. Drlg. sdy. sh. 5,647 ft.
Wm. Helis' No. 1 L.S.U., Sec. 67-7s-1w. Drlg. sh. 5,048 ft.
Wm. Helis' No. 4A L.S.U., Sec. 67-7s-1w. T.D. 6,489 ft.; 7-in. csg. 6,484 ft.; I.P. 311 B.P.D.; 11/64-in. ck.
Wm. Helis' No. 4 Materiste, Sec. 66-7s-1w. Drlg. sdy. sh. 1,742 ft.
T. G. Markley et al No. 3 Knox, Amis-Farnbacher, Sec. 66-7s-1w. 16-in. csg 60 ft.
T. G. Markley et al's No. 7 Knox et al, Sec. 66-7s-1w. T.D. 6,484 ft.; 7-in. csg 6,477 ft.; I.P. 373 B.P.D.; ¼-in. ck.
Marshland Oil Co.'s No. 1 J. B. McDonald, Sec. 45-7s-1e. Drlg.
Sugarfield Oil Co.'s No. 2 Irby Nichols, Sec. 45-7s-1e. Drlg. sh. 2,997 ft.
Texas Canadian Oil Co.'s No. 2 Bogan-Davidson, Sec. 67-7s-1w. R.U.

Bay St. Elaine—Terrebonne Parish

Texas Co. No. 19 State-Bay St. Elaine, Sec. 18-22s-18e. T.D. 6,500 ft.; 9⅝-in. csg. 6,400 ft.; T.D. 7,028 ft.; 7-in. csg. 7,028 ft.; perf. csg. 6,440-6,500 ft. tbg. plugged up; pulling screen.

Bayou Choctaw—Iberville Parish

Standard Oil Co. (La.) No. 11 Wilbert, Sec. 53-9s-11e. T. salt 718 ft.; T.D. 4,833 ft.; 7-in. csg. 4,833 ft.; perf. csg. 4,800-33 ft.; I.P. 275 B.P.D.; 10/32-in. ck.

Bayou des Glaises—Iberville Parish

Humble O. & R. Co. No. 1-B Wilbert, Sec. 78-8s-8e. T.D. 3,025 ft.; 13⅜-in. csg. 3,000 ft.; T. salt 4,101 ft.; T.D. 4,182 ft.; S.D.
Humble O. & R. Co.'s No. 2-B Wilberts, Sec. 78-8s-8e. Loc.

Black Bayou—Cameron Parish

Earth Pet. Co. No. 2 R. A. Moore, Sec. 18-12s-12w. S.D. 8,332 ft.

Caillou Island—Terrebonne Parish

Texas Co.'s No. 61 State, Sec. 17-23s-20e. Drlg. sd. 3,610 ft.

Cameron Meadows—Cameron

Magnolia Pet. Co. No. 25 Cameron Meadows, Sec. 21-14s-13e. T.D. 6,955 ft.; 7-in. csg. 6,494 ft.; perf. csg. 6,447-54 ft.; tstg.

Chacahoula—La Fourche Parish

Sun Oil Co. No. 1 Cypress, Sec. 75-15s-15e. 13⅜-in. csg. 1,842 ft.; T. salt 6,072 ft.; T.D. 6,088 ft.; P.B. 2,100 ft.; sdtrkd.; T.D. 6,553 ft.; fsg.; sdtrkd.; drlg. sh.&sd. 3,450 ft.
Sun Oil Co.'s No. 6 Dibert, Stark & Brown, Sec. 70-15s-15e. Loc.
Sun Oil Co. No. 2 Bodge Sunberry, Sec. 65-15s-15e. S.D. 4,259 ft.; T.A.

Chalkley Field—Cameron Parish

Humble O. & R. Co.'s No. 1 Cameron Sch. Bd., Sec. 16-12s-6w. Loc.
Humble O. & R. Co.'s No. 5 K. B. Hanzen, Sec. 9-12s-6w. Drlg.
Humble O. & R. Co. No. 4 Sweet Lake Ld. & O. Co., Sec. 7-12s-6w. T.D. 8,448 ft.; P.B. 7,508 ft.; sdtrkd.; T.D. 8,462 ft.; abd.
Humble O. & R. Co.'s No. 5 Sweet Lake Ld. & Oil Co., Sec. 7-12s-6w. Drlg. 2,776 ft.
Shell Oil Co., Inc., No. 3 Hanzen, Sec. 21-12s-6w. 10¾-in. csg. 2,752 ft.; cg. oil sd. 8,818 ft.; T.S. 8,815 ft.; T.D. 9,300 ft.; 5-in. csg. 9,299 ft.; P.B. 8,925 ft.; perf. csg. 8,883-8,915 ft.; P.B. 8,880 ft.; I.P. 453 B.P.D.; ¼-in. ck.
Shell Oil Co., Inc.'s No. 4 Hanzen. Drlg. sh. 2,320 ft.

Charenton—St. Mary Parish

Knisley Oil Co.'s No. 8 Leblanc, Sec. 21-13s-9e. T.D. 2,985 ft.; abd.
Pan American Prod. Co.'s No. 3-A H. Ecuer, Sec. 11-13s-9e. Drlg.
Pan American Prod. Co.'s No. 17 Laws Realty Co., Sec. 31-13s-10e. Drlg.
Pan American Prod. Co.'s No. 6 South Coast Corp., Sec. 31-13s-10e. Drlg.

Chaneyville—Rapides Parish

Amerada Pet. Corp.'s No. 6 Well, Sec. 54-1s-2e. T.D. 5,842 ft.; 5½-in. csg. 5,809 ft.
Gulf Oil Corp.'s 1-A C. J. Pope, Sec. 56-1s-2e. T.D. 5,745 ft.; 5½-in. csg. 5,745 ft.; perf. csg. 5,722-44 ft.; I.P. 389 B. P.D.; ¼-in. ck.
Gulf Oil Corp.'s No. 2 M. Pope, Sec. 56-1s-2e. R.U.
S. W. Richardson's No. 4 Well, Sec. 54-1s-2e. Drlg. sh. 2,810 ft.

Convent—St. James Parish

Continental Oil Co.'s No. 2 Realty. P.B. T.D. 8,045 ft.; P.B. 6,342 ft.; tstg.; flwg. gas and dist.

Creole—Cameron Parish

Superior Oil Co.'s No. 8 State, Twp. 15s-8w. T.D. 7,151 ft.; 5½-in. csg. 6,807 ft.; perf. csg. 6,750-52 ft.; I.P. 2 B.P. H.; 7/64-in. ck.

Darrow—Ascension Parish

Humble O. & R. Co.'s No. 25 Community, Sec. 31-10s-2e. Loc.
Humble O. & R. Co.'s No. 16 Gumbel, Sec. 36-10s-2e. S.O. 8,205-55 ft.; T.D. 8,445 ft.; 7-in. csg. 8,374 ft.; perf. csg. 8,250-54 ft.; made sqz. job.
Kiva Oil Co. No. 1 Duplessis, Sec. 69-10s-2w. S.D. 2,523 ft.

Dog Lake—Terrebonne Parish

Texas Co. No. 23 State, Sec. 5-22s-16e. T.D. 7,429 ft.; P.B.; sdtrkd.; T.D. 6,105 ft.; P.B.; sdtrkd.; drlg. sdy. sh. 6,391 ft.

Eola—Avoyelles Parish

Amerada Pet. Corp.'s No. 3 Glaze, Sec. 6-2s-3e. Drlg. sh. 6,412 ft.
Amerada Pet. Corp.'s No. 3 Irion, Sec. 6-2s-3e. R.U.
Amerada Pet. Corp.'s No. 5 C. B. Marchive, Sec. 6-2s-3e. T.D. 8,530 ft.; 5½-in. csg. 8,529 ft.
Amerada Pet. Corp.'s No. 6 Marchive, Sec. 6-2s-3e. Drlg. sh. 7,930 ft.
Amerada Pet. Corp.'s No. 1 White et al, Sec. 7-2s-3e. R.U.
Gulf Explin. Co. No. 5 Samuel Haas Est., Sec. 8-2s-3e. T.D. 8,584 ft.; 5½-in. csg. 8,584 ft.; perf. csg. 8,565-70 ft.; flwd. oil; went dead; perf. csg. 8,569-82 ft.
Geo. Lilly et al No. 1 Dent, Sec. 1-2s-2e. T.D. 8,576 ft.; 5½-in. csg. 8,576 ft.
Sid Richardson No. 3 State-Bayou Bouef, Sec. 6-2s-3e. Drlg. sh. 8,412 ft.
S. W. Richardson's No. 1-A Haas, Sec. 11-2s-2e. Loc.
S. W. Richardson's No. 6 Haas Inv. Co., Sec. 7-2s-3e. T.D. 8,579 ft.; 5½-in. csg. 8,579 ft.

Fausse Point—Iberia Parish

Texas Co.'s No. 6 State, Twp. 11s-8e. 13⅜-in. csg. 1,407 ft.; cg. sd. 3,943 ft.

Garden Island—Plaquemines Parish

Texas Co.'s No. 37 State, Garden Island, Sec. 38-23s-33e. Drlg. sh. 6,573 ft.

Golden Meadows—La Fourche Parish

Acadian Prod. Co.'s No. 1 Dr. L. P. LeBlanc, Sec. 2-19s-22e. R.U.
Bennett Oil Co.'s No. 3 Cheramie, Sec. 12-19s-22e. Loc.
Berkshire Oil Co.'s No. 4 Nichol, Sec. 9-19s-22e. T.D. 5,650 ft.; 7-in. csg. 5,440 ft.; perf. csg. 5,170-76 ft.; I.P. 410 B. P.D.; ¼-in. ck.
Berkshire Oil Co.'s No. 7 Nicol, Sec. 9-19s-22e. R.U.
Brown & Woods' No. 1 S. Hogan, Sec. 9-19s-22e. Drlg. sh. 1,618 ft.
Peter Cloban's No. 1 Nat Alario, Sec. 2-19s-22e. Loc.
Golden Meadows Oil Co.'s No. 1 Whitney Rebstock, Sec. 2-19s-22e. Drlg.
Wm. Helis' No. 2 Gaspard & Regan, Sec. 9-19s-22e. T.D. 900 ft.; P.B. 600 ft.; to sdtrk.; T.D. 2,772 ft.; P.B. 2,440 ft.
M. H. Marr and R. A. Bristol No. 1 Church property, Sec. 2-19s-22e. T.D. 7,724 ft.; sdtrkd.; T.D. 9,007 ft.; P.B. and sdtrkd.; T.D. 2,652 ft.; T. sd. 2,647 ft.; 7-in. csg. 2,647 ft.; tstd. S.W. and oil; P.B. 2,000 ft.; sdtrkd.; T.D. 2,666 ft.; T.S. 2,648 ft.; flwd. oil and S.W.; perf. csg. 2,647-64 ft.; flwd. gas and S.W.; went dead; T.A.
M. H. Marr & G. H. Vaughn No. 1 Adam Terrebonne, Sec. 9-19s-22e. T.D. 9,011 ft.; 7-in. csg. 8,950 ft.; perf. csg. 7,895-7,935 ft.; I.P. 462 B.P.D.; 12/64-in. ck.
Martex Oil Co.'s No. 1 Rebstock, Sec. 2-19s-22e. Loc.
M. H. Marr & Vaughn's No. 2 Adam Terrebonne, Sec. 9-19s-22e. R.U.
St. Mary Oil Co.'s No. 1 Choust, Sec. 12-19s-22e. T.D. 5,561 ft.; 5½-in. csg. 5,544 ft.
St. Mary Oil Co.'s No. 2 Choust, Sec. 12-19s-22e. T.D. 5,282 ft.; P.B. 5,208 ft.; perf. csg. 5,178-94 ft.; would not flw. reperf. csg. 5,180-90 ft.; run tbg.
St. Mary Oil Co.'s No. 1 Williams, Sec. 12-19s-22e. Drlg.
Texas Co.'s No. 2 Falgout Holding Co., Sec. 9-19s-22e. T.D. 7,952 ft.; 7-in. csg. 7,912 ft.; I.P. 309 B.P.D.; ¼-in. csg.
Texas Co.'s No. 3 Falgout Holding Co., Sec. 9-19s-22e. T.D. 2,670 ft.; 7-in. csg. 2,645 ft.
Texas Co.'s No. 5 L.L.&E., Golden Meadows, Sec. 78-19s-21e. T.D. 7,949 ft.; 7-in. csg. 7,921 ft.
Texas Co.'s No. 6 L.L.&E.-Golden Meadows, Sec. 78-19s-21e. Loc.
Texas Co. No. 3 State-Catfish Lake, Sec. 76-19s-21e. T.D. 3,509 ft.; 7-in. csg. 2,805 ft.; perf. csg. 2,740-62 ft.; W.O. S.R.
Texas Co. No. 1 Theriot, Sec. 12-19s-21e. T.D. 10,100 ft.; 7-in. csg. on bttm.; perf. csg. 7,190-7,210 ft.; tstd. S.W.

Grand Bay—Plaquemines Parish

Gulf Oil Corp.'s No. 5-A Grand Prairie, Sec. 31-19s-19e. Drlg. sh. 6,573 ft.
Gulf Oil Corp. No. 6-A Grand Prairie Lv. Dist., Sec. 17-20s-10e. T.D. 9,380 ft.; 7-in. csg. 9,373 ft.
Gulf Oil Corp.'s No. 7-A Grand Prairie Lv. Dist., Sec. 5-20s-19e. Loc.
Gulf Oil Corp.'s No. 8-A Grand Prairie Dist., Sec. 5-20s-19e. Loc.
Gulf Oil Corp.'s No. 4 State, Sec. 20-19s-19e. Loc.
Texas Co. No. 1 State-Lookout Pass, Sec. 48-20s-18e. Loc.

Grand Lake—Cameron Parish

Amerada Pet. Corp. No. 1 Mallard Bay State, Sec. 12-13s-4w. T.D. 9,681 ft.; 5½-in. csg. 8,579 ft.; gas sd. 8,300 ft.; O.S. 8,385-8,415 ft.; 5½-in. csg. 8,461 ft.; perf. csg. 8,380-8,415 ft.; I.P. 327 bbl. in 22 hrs.; various chokes.
Superior Oil Co.'s No. 3 State. T.D. 9,776 ft.; abd.

Hackberry—Cameron Parish

W. T. Burton's No. 1 R. L. Lewis, Sec. 22-12s-10w. T.D. 4,202 ft.; I.P. 236 B. P.D.; pmpg.
Gulf Oil Corp. No. 25-A Erwin, Sec. 13-12s-10w. Drlg.
Superior Oil Co.'s No. 7 Benson Vincent, Sec. 30-12s-10w. R.U.
Texas Co. No. 27-B State, 623 ft. S, and 5,142 ft. E of SE cor. Sec. 12-12s-10e, in Twp. 12s-9w. T.D. 7,843 ft., salt; T. salt 7,839 ft.; P.B. 6,500 ft.; sdtkd.; drlg. sh. 6,923 ft.
Union Sulphur Co.'s No. 1 Simon Doiron, Sec. 37-12s-10w. Drlg. sdy. sh. 4,020 ft.

Horseshoe Bayou—St. Mary Parish

Texas Co.'s No. 3 State, Sec. 40-17s-9e. Drlg. sh. 10,374 ft.

Jeanerette—St. Mary Parish

Herton Oil Co.'s No. 6 Roane, Sec. 38-13s-9e. Drlg. sh.&L. 7,114 ft.

Jefferson Island—Iberia Parish

Texas Co.'s No. 3 Jefferson Salt Mining Co., Sec. 58-12s-5e. Drlg. sh. 6,730 ft.

Jennings—Acadia Parish

Carter-Perrin & Brian No. 1 Martel, Sec. 47-9s-2w. T.D. 1,916 ft.; 6-in. csg. 1,862 ft.; T.A.
Glassell-Glassell No. 8 Trusher, Sec. 42-9s-2w. Drlg. sdy. sh. 4,020 ft.
Shell Oil Co., Inc.'s No. 8 Community. R.U.
Shell Oil Co., Inc., No. 7 Conover, Sec. 40-9s-2w. 5½-in. csg. 7,166 ft.; T.D. 7,704 ft.; P.B. 7,666 ft.; cleaned hole to 6,888 ft.; perf. csg. 7,520-30 ft.; I.P. 428 B.P.D.; 17/64-in. ck.
Stanolind O. & G. Co. No. 115 Crowley Oil & Min. Co., Sec. 48-9s-2w. Drlg. sd.&L. 6,310 ft.

Lafitte—Jefferson Parish

Texas Co. No. 14 Lafitte, Sec. 20-17s-24e. Drlg. sh. 4,599 ft.

Texas Co.'s No. 4 Marrero, Sec. 21-17s-24e. Drlg. sdy. sh. 3,040 ft.

Lake Long—La Fourche Parish

Fohs Oil Co. No. 10 State, 1,320 ft. N of No. 3, in Lake. T.D. 3,208 ft.; twisted off D.S.; sdtrkd. 2,940 ft.; T.D. 9,614 ft.; 6-in. csg. 9,614 ft.; perf. csg. 9,355-60 ft.; tstd. S.W. on D.S.T.; sqzd. perf.; W.O.C.; perf. csg. 9,352-55 ft.; flwd. 125 B.O., 340 bbl. S.W.; sqzd. perf.; perf. csg. 9,353-55 ft.; I.P. 48 bbl. net oil, 90% S.W.; ¼-in. ck.

Fohs Oil Co.'s No. 11 State, Twp. 17s-19e. Loc.

Lake Mongoulois—St. Martin Parish

Texas Co. No. 7 State, Sec. 10-10s-6e. 7⅝-in. csg. 10,604 ft.; T.D. 10,775 ft.; perf. csg. 10,220-40 ft.; testd. gas; sqzd. perf.; perf. csg. 9,739-49 ft.; tstd. 3,000 lb. W.P.

Lake Pelto—Terrebonne Parish

Texas Co.'s No. 27 State, Sec. 7-23s-18e. 10¾-in. csg. 1,484 ft.; T.D. 5,233 ft.; salt; T. salt 4,718 ft.; sdtrkd.; T. salt 4,879 ft.; T.D. 5,551 ft.; P.B.; sdtrkd.; T.D. 5,255 ft.; 7-in. csg. 5,230 ft.; perf. csg. 5,231-39 ft.; I.P. 580 B.P.D.; ¼-in. ck.

La Pice—Iberville Parish

Shell Oil Co., Inc.'s No. 1 Lebermuth & Israel. Drlg. sh. 5,784 ft.

Shell Oil Co., Inc.'s No. 2 Natalbany Lbr. Co., Sec. 19-9s-2e. Cg. sd. 8,215 ft.

Leeville—Plaquemines Parish

Texas Co.'s No. 72 L.L.&E., Sec. 27-21s-22e. T.D. 5,041 ft.; sdtrkd.; drlg. sdy. L. 6,151 ft.

New Iberia—Iberia Parish

Wm. Helis' No. 7 Sabatier, Sec. 54-12s-7e. Drlg. 1,312 ft.

Wm. Helis No. 7 J. E. Schwing, Sec. 56 12s-7e. Drlg. sdy. sh. 8,701 ft.

J. J. Hooper's No. 1 Marston, Sec. 51-12s-7e. Drlg. 1,300 ft.

Texas Co. No. 2 Bryant, Sec. 25-12s-7e. R.U.

Texas Co.'s No. 11 J. P. Duhe, Sec. 26-12s-7e. T. salt 3,412 ft.; T.D. 3,415 ft.; P.B. 2,500 ft.; sdtrkd.; T.D. 3,777 ft.; 7-in. csg. 3,729 ft.; W.O.S.R.

Texas Co.'s No. 3 Schwing, Sec. 71-12s-7e. Drlg. sdy. L. 5,635 ft.

North Crowley—Acadia Parish

Humble O. & R. Co.'s No. 6 Williams, Sec. 33-8s-1e. Drlg. sh. 6,500 ft.

North Elton—Allen Parish

Stanolind O. & G. Co.'s No. 1 G. W. Jenkins, Sec. 23-6s-3w. Drlg. sd. 643 ft.

Paradis—St. Charles Parish

Texas Co. No. 2 L.L.&E. Paradis, Sec. 6-14s-20e. Cd. sd., dist. odor 10,085-89 ft.; drlg. sh. 10,220 ft.

Port Barre—St. Landry Parish

Gulf Oil Corp.'s No. 15 Wilson & Cochran, Sec. 4-6s-5e. T.D. 4,781 ft.; P.B.; sdtrkd. 4,100 ft.; T.D. 5,116 ft.; 5-in. csg. 5,116 ft.

Pan American Prod. Co.'s No. 4 Cormier, Sec. 4-6s-5e. T.D. 5,425 ft.; perf. csg. 4,959-65 ft.; tstd. S.W.; S.D.

Pan American Prod. Co. No. 8 Cormier, Sec. 4-6s-5e. R.U.

Pan American Prod. Co.'s No. 5 Garland, Sec. 4-6s-5e. Loc.

Y. D. Spill No. 1 Gaudet, Sec. 4-6s-5e. S.D. 4,700 ft.

Potash—Plaquemines Parish

Humble O. & R. Co. No. 40 Orleans Lv. Bd., Sec. 13-18s-15e. T.D. 4,752 ft.; losing returns.

Quarantine Bay—Plaquemines Parish

Gulf Oil Corp.'s No. 3-A Plaquemines Ld. Co., Sec. 7-19s-17e. T.D. 1,582 ft.; csg. parted.

Gulf Oil Corp. No. 9 State QQ, Sec. 18-19s-17e. Loc.

Gulf Oil Corp.'s No. 15 State, Twp. 19s-17e. Drlg. sh. 5,389 ft.

Sorrento—Ascension Parish

Sorrento Synd. No. 1 L. L. Bernard, Sec. 27-10s-4e. Drlg. sh. 6,527 ft.

South Houma—Terrebonne Parish

Shell Oil Co., Inc.'s No. 4 Peters, Sec. 72-18s-18e. Drlg. sh. 4,832 ft.

South Roxnoke—Jeff Davis Parish

Continental Oil Co.'s No. 2 Calcasieu Natl. Bnk., Sec. 35-10s-4w. T.D. 10,090 ft.; abd.

Valentine—La Fourche Parish

Wm. Helis' No. 5 Valentine Sugars, Inc., Sec. 2-17s-20e. 10¾-in. csg. 1,632 ft.; drlg. sh. 7,687 ft.

Pan American Prod. Co.'s No. 3-A Community, Sec. 10-17s-20e. Drlg. sd.&sh. 6,800 ft.

Venice—Plaquemines Parish

Tide Water Asso. Oil Co.'s No. 6 Buras Lv. Bd., Sec. 27-21s-30e. Drlg. sh.&shll. 9,085 ft.

Villa Platte—Evangeline Parish

Continental Oil Co. No. 2 Corell, Sec. 36-3s-2e. T.D. 10,360 ft.; 6-in. csg. 10,360 ft.; perf. csg. 8,980-90 ft.; tstd. mud and S.W.

Continental Oil Co.'s No. 4 A. M. Fontenot, Sec. 46-3s-2e. Drlg. sh. 5,630 ft.

Continental Oil Co.'s No. 5 Fontenot, Sec. 26-3s-2e. Drlg. sh. 6,700 ft.

Continental Oil Co.'s No. 6 Ludeau Haas, Sec. 45-3s-2e. Drlg. sh. 7,786 ft.

Continental Oil Co.'s No. 5 Opelousas, St. Landry, Sec. 44-3s-2e. T.D. 7,903 ft.; fsg.

Continental Oil Co.'s No. 4 Pitre, Sec. 44-3s-2e. R.U.

Continental Oil Co.'s No. 3 Vidrine, Sec. 34-3s-2e. T.D. 8,971 ft.; 6-in. csg. 8,971 ft.; I.P. 199 B.P.D.; 11/64-in. ck.

West Guesydan—Vermilion Parish

Magnolia Pet. Co.'s No. 2 A. Cormier, Sec. 5-12s-2w. T.D. 7,256 ft.; 7-in. csg. 7,256 ft.

West Lake Verret—St. Mary Parish

Shell Oil Co., Inc., No. 1 Michel, Sec. 1-14s-12e. T.D. 11,309 ft.; make D.S.T.

White Castle—Iberville Parish

Shell Oil Co., Inc.'s No. 1 Baist. Drlg. sdy. L. 5,046 ft.

Woodlawn—Jeff Davis Parish

Union Sulphur Co. No. 1 Raymond Hebert, Sec. 6-9s-5w. T.D. 9,575 ft.; 7-in. csg. 9,575 ft.; perf. csg. 9,480-84 ft.; flwg. dist. and S.W.

Union Sulphur Co.'s No. 1 E. A. Norton, Sec. 12-9s-5w. R.U.

Union Sulphur Co. No. 3 Mrs. O'Miller, Sec. 7-9s-5w. Drlg. sdy. sh.&L. 4,612 ft.

Woodlawn Oil Corp.'s No. 1 Hebert, Sec. 1-9s-6w. R.U.

S. LOUISIANA WILDCATS

Acadia Parish

Mareaux Oil Corp. No. 2 J. E. Settig, Sec. 17-7s-1w. T.D. 1,324 ft.; abd.

Providence Oil Co.'s No. 1 Jos. John est., Sec. 37-10s-1e. Drlg. sh. 8,000 ft.

Tri Parish Drillers, Inc., No. 1 Paul Stag, Sec. 4-7s-1w. M.I. rig.

Allen Parish

Bel Oil Co. No. 2 J. A. Bell Est. (Blue Springs). Drlg.

Assumption Parish

Shell Oil Co., Inc.'s No. 1 C. S. Eellis, Sec. 9-16s-14e. Drlg. 122 ft.

Beauregard Parish

Atlantic Ref. Co. No. 1 Lutcher Moore, Sec. 22-3s-11w. Loc.

Atlantic Ref. Co. No. 1 Rice Ld. & Lbr. Co., Sec. 22-3s-11w. Loc.

California Co.'s No. 2 Long Bell Lbr. Co., Sec. 12-5s-10w. Drlg. sh. 4,060 ft.

Republic Prod. Co.'s No. 9 Lutcher Moore Lbr. Co., Sec. 1-7s-12w. R.U.

Calcasieu Parish

C. L. Arnette's No. 1 Arthur Welch, Sec. 19-10s-12w. 10¾-in. csg. 130 ft.; T.D. 395 ft.; S.D.

Gulf Oil Corp.'s No. 1 Amanda Brannon, Sec. 16-11s-10w. Drlg. sh. 7,373 ft.

Cameron Parish

Humble O. & R. Co.'s No. 1 fee, Sec. 7-15s-14w. Drlg. sh. 2,036 ft.

East Baton Rouge Parish

Farris & Golding Drlg. Co.'s No. 1 D. E. McEnnis, Sec. 58-7s-1e. R.U.

Iberia Parish

Plymouth Oil Co. et al's No. 1 Lynch McHugh, Sec. 13-12s-10e. R.U.

Jefferson Parish

California Co. No. 1 Adam Rutley, Sec. 2-16s-23e. 20-in. csg. 163 ft.; 13⅜-in. csg. 1,990 ft.; 9⅝-in. csg. 8,496 ft.; T.D. 11,818 ft.; sdtrkd.; drlg. sdy. sh. 12,051 ft.

Continental Oil Co. No. 1 Bernstein, Sec. 2-16s-23e. Drlg. sh. 8,619 ft.

Jeff Davis Parish

Housh & Thompson's No. 1 Lacassine, Sec. 29-11s-5w. Drlg. sh.&sd. 3,890 ft.

Lafayette Parish

Stanolind O. & G. Co.'s No. 1 Lacaze Billeaud et al, Sec. 35-10s-5e. Drlg. sh. &L. 6,165 ft.

La Fourche Parish

Gulf Oil Corp. No. 2 Grandison, Sec. 21-20-23e. 13⅜-in. csg. 2,090 ft.; drlg. sdy. L. 10,553 ft.

Tide Water Asso. Oil Co. No. 1 Delta Farms, Inc., Sec. 6-17s-23e. Drlg. sdy. L. 8,057 ft.

Livingston Parish

Humble O. & R. Co.'s No. 1 Great Southern Lbr. Co., Sec. 27-7s-5e. Drlg. sd. 8,775 ft.

Orleans Parish

W. T. Burton No. 1 L.&N.R.R., Sec. 18-11s-15e. T.D. 10,394 ft.; 5½-in. csg. 10,274 ft.; S.D.

St. Bernard Parish

Gulf Ref. Co. No. 4-State-R.R. (Lake Borgne), Twp. 12s-15e. 9⅝-in. csg. 8,161 ft.; T.D. 10,632 ft.; P.B. 9,700 ft.; rmd. to 9,658 ft.; lost core bbl.; P.B. sdtrkd. 8,912 ft.; T.D. 10,528 ft.; 7-in. csg. 10,494 ft.; fsg.

St. John the Baptist Parish

Pan American Prod. Co. No. 1 Mill, Sec. 12-11s-7e (LaPlace prospect). 10¾-in. csg. 2,837 ft.; T.D. 8,896 ft.; D.S.T. 8,870-96 ft.; tstd. 600 lb. W.P.; rec. 10 gal. dist.; cg. sd. 9,445 ft.

St. Martin Parish

Wm. Helis' No. 2 Levert Plantation, Sec. 33-9s-7e. Drlg. sd. 1,267 ft.

Wm. Helis' No. 1 Rycade Oil Co., Sec. 33-9s-7e. Drlg. sdy. sh. 5,368 ft.

Shell Oil Co., Inc., No. 1 Iberville Ld. Co., Sec. 86-8s-7e. Cg. sdy. L. 9,012 ft.

St. Mary Parish

Perry S. Cooney No. 1 A. W. Allain, Sec. 46-13s-9e. S.D. 2,600 ft.

Terrebonne Parish

Barnsdall Oil Co.'s No. 1 Nelson, Sec. 2-21s-11e. Loc.

Continental Oil Co. et al's No. 1 Peters, Sec. 32-19s-15e. 13⅜-in. csg. 1,987 ft.; drlg. sdy. sh. 7,225 ft.

Shell Oil Co., Inc., No. 1-A Peters, Sec. 47-19s-19e. Drlg. sh. 11,450 ft.

Texas Co. No. 3 State-Coon Point, Twp 23s-14e. 10¾-in. csg. 1,860 ft.; T. salt 8,475 ft.; T.D. 8,488 ft.; abd.

Vermilion Parish

La. Ld. & Explo. Co.'s No. 3 La. Fur Co., Sec. 9-15s-1e. R.U.

Texas Co.'s No. 1 Vermilion Par. Sch. Bd., Sec. 16-13s-4e. Drlg.

Vernon Parish

Pan American Prod. Co.'s No. 1 Anderson-Post Lbr. Co., Sec. 27-2n-11w. 9-in. csg. 985 ft.; T. Wlx. reported at 4,550 ft.; T.D. 6,508 ft.; abd.

Phillips Pet. Co. No. 1 Wimhurst (NW extension). T.D. 10,962 ft.; well tried to blow out; D.S. stk.; fsg.

Aldine—Harris County

Earl C. Hankamer's No. 1 O. P. Hairgrove, S. L. Noble Sur. Drlg. sh. 4,500 ft.

Bammel—Harris County

H. M. Harrell's No. 1 Graves, C. Walters Sur. T.D. 6,200 ft.; tstg.

H. M. Harrell's No. 1 R. M. Thornton, Ehrhardt & Ketchum Sur. Loc.

Clear Lake—Harris County

Humble O. & R. Co.'s No. 19-C Humble-West, Wm. Doble Sur. T.D. 5,906 ft.; 5½-in. csg. 5,900 ft.

Humble O. & R. Co.'s No. 23-C Humble-West, Jas. Roth Sur. Drlg. sh. 4,410 ft.

Friendswood—Harris County

Humble O. & R. Co.'s No. 31 Beamer, T. Choate Sur. T.D. 6,047 ft.; fsg.

Humble O. & R. Co.'s No. 5-B Godwin, W. K. Smith Sur. T.D. 6,042 ft.; tstg.

Texana—Jackson County

Moore-Ahern's No. 1 Clement, Stephen F. Austin Sur. Drlg. 5,000 ft.

Fannett—Jefferson County

Gulf Oil Corp.'s No. 12 Burrell, W. H. Smith Sur. T.D. 3,625 ft.; D.S.T. 3,614-35 ft.; rec. 34 thrib. oil; 7-in. csg. 3,629 ft.

La Belle—Jefferson County

Sun Oil Co. No. 5 Broussard-Hebert, T. &N.O. Sur. No. 207. T.D. 8,710 ft.; perf. csg. 8,685-90 ft.; flwd. S.W.; made sqze. job; perf. csg. 8,667-71 ft.; tstd. S.W.; made sqze. job; S.D.

Lovells Lake—Jefferson County

Humble O. & R. Co.'s No. 7 Broussard, M. Grange Sur. Drlg. sh. 4,039 ft.

Humble O. & R. Co.'s No. 10 Broussard, M. Grange Sur. T.D. 6,900 ft.; well tried to blow out; abd.

Humble O. & R. Co.'s No. 6 Jefferson Ld. Co., C. Hillebrandt Sur. T.D. 7,793 ft.; 5½-in. csg. 7,786 ft.

Humble O. & R. Co.'s No. 2-B Steinhagen, A. O. O'Donnell Sur. Drlg. sh. 3,036 ft.

Humble O. & R. Co.'s No. 3-B Steinhagen, A. O. Donnell Sur. Loc.

Stanolind Oil & G. Co.'s No. 1-B Steinhagen, H. O. Donnell Sur. Drlg. sh.& L. 5,510 ft.

South China—Jefferson County

Hebert-Smith's No. 1 Broussard, Sarah Miles Sur. Drlg. sh. 6,850 ft.

Esperson—Liberty County

General Crude Oil Co.'s No. 7-B Esperson, A. McNeil Sur. Loc.

General Crude Oil Co.'s No. 9-B Esperson, A. McNeil Sur. Drk.

Hull—Liberty County

Gulf Oil Corp. No. 115 Phoenix Dev. Co., J. Devore Lge. (SE flank deep test). T.D. 6,595 ft.; 9⅝-in. csg. 5,904 ft.

Martha—Liberty County

Stanolind O. & G. Co.'s No. 1 Frank Charzan, I.&G.N. Sur. 7. T.D. 8,164 ft.; 5½-in. csg. 8,163 ft.

Stanolind O. & G. Co.'s No. 1 R. G. Palmer, I.&G.N. Sur. 7. M.I.M.

Ace—Polk County

Shell Oil Co., Inc.'s No. 1 Kirby-West Lbr. Co., G. S. Thomas Sur. T.D. 8,430 ft., sd.

TEXAS

Week Ending October 21

GULF COAST FIELDS

Anchor—Brazoria County

Humble O. & R. Co.'s No. 1 M. W. Metler, J. de Jesus Valderas Sur. 13⅜-in. csg. 944 ft.; drlg. sh. 4,952 ft.

Glenn McCarthy's No. 1 Ida M. Salmon and John Muma, Geo. Robinson Sur. Drlg. sh. 4,722 ft.

Old Ocean—Brazoria County

Harrison & Abercrombie No. 6 Armstrong-fee, Polly-Chance Sur. T.D. 10,421 ft.; tstg.

Harrison-Abercrombie's No. 7 Armstrong, Polly & Chance Sur. Drlg. sdy. sh. 6,200 ft.

Harrison & Abercrombie's No. 1 Berthelsen, C. Breen Sur. Drlg. sh. 7,810 ft.

Mid-Continent Pet. Corp. No. 2 Chenault, C. Breen Sur. T.D. 10,400 ft.; tstg.

Sun Oil Co. No. 2 Borsodi, C. Breen Sur. 9⅝-in. csg. 7,005 ft.; T.D. 10,291 ft.; 7-in. csg. on bttm.; perf. csg. 10,165-80 ft.; tstg.

Sun Oil Co.'s No. 3 Campbell, C. Breen Sur. 13⅜-in. csg. 1,506 ft.; drlg. sh.& L. 4,729 ft.

Cedar Point—Chambers County

Standard Oil Co. of Texas' No. 24-118 State. Top oil sd. 5,943 ft.; 7-in. csg. 6,005 ft.

Seabreeze—Chambers County

Sun Oil Co. No. 2 Hoffman, T.&N.O. Sur. No. 131. T.D. 8,400 ft.; W.O.C.

South Cotton Lake—Chambers County

Salt Dome Oil Co.'s No. 3-A Lawrence, S. Barrow Sur. T.D. 6,530 ft.; 5½-in. csg. 6,512 ft.; perf. csg. 6,518-21 ft.; I.P. 151 B.P.D.; ¼-in. ck.

Turtle Bay—Chambers County

Stanolind O. & G. Co.'s No. 2 State, Tr. 39. Driving piling.

Garwood—Colorado County

Davis & Co., Inc., No. 1 J. R. McLane, I.&G.N. Sur. 41. T.D. 8,963 ft.

Big Creek—Fort Bend County

Merrimac Oil Corp. No. 1 George, B. Wickson Sur. (SW flank). Spd. and S.D.

Thompson—Fort Bend County

J. H. Blaffer's No. 3 Davis, Robert Peebles Sur. T.D. 5,430 ft.; W.O.C.

League City—Galveston County

Phillips Pet. Co.'s No. 1 Brittnacher, S. F. Austin Sur. Drlg. sh. 2,730 ft.

Phillips Pet. Co.'s No. 6 Loblt, Perry-Austin Sur. Drlg. 2,730 ft.

Phillips Pet. Co. No. 1 Dr. O. Patton (1 mi. E of production). Perf. csg. 9,177-97 ft.; flwd. S.W.; sqzd. perf.; C.O.

Phillips Pet. Co.'s No. 1 J. S. Rice Est., J. M. Perry & Austin Sur. Drlg. sh. 3,812 ft.

Phillips Pet. Co.'s No. 3 Stewart Title Guaranty Co., S. F. Austin Sur. R.U.

Phillips Pet. Co.'s No. 4 Stewart Title Guaranty Co., S. F. Austin Sur. 10¾-in. csg. 3,520 ft.; drlg. sh. 8,136 ft.

McGREGOR

Nearly 100,000 Working Barrels in Use

OUR working barrels have been continually improved for 30 years. We have worked with producers in developing many special features for pumping.

We will be glad to try to help you out of your difficulties.

McGREGOR WORKING BARREL COMPANY

Bradford, Pa., U.S.A.

Segno—Polk County

J. K. Dorrance's No. 5-A Wing, I.&G.N. Sur. Drlg. sh. 2,236 ft.
Gulf Oil Corp. No. 4 Quinn, A. Morales Sur. R.U.
Gulf Oil Corp.'s No. 4 Wing, I.&G.N. Sur., Sec. 15. Drlg. sh. 2,936 ft.
Gulf Oil Corp.'s No. 23 Wing, P. Garcia Sur. Drlg. sh. 7,318 ft.
Humble O. & R. Co.'s No. 17-BX Kirby Lbr. Co., P. Garcia Sur. Drlg. sh. 7,639 ft.

Spurger—Tyler County

Republic Prod. Co.'s No. 26 fee, N. Hurd Sur. Drlg. sd.&sh. 5,477 ft.
Republic Prod. Co.'s No. 27 fee, N. Hurd Sur. Drlg. sh. 2,240 ft.

GULF COAST WILDCATS

Brazoria County

Fabriguze et al No. 1 Freeport Sulphur Stephen F. Austin Sur. (Byran Mound) M.I.M.
Hamman Explrn. Co. No. 1-B Darrington, State Prison Farm, F. Bingham Sur. Rig.
D. M. Hill's No. 1 Max Bader, Wm. Smeathers Lge. Loc.
Humble O. & R. Co.'s No. 1 Hiram Moore, Hooper & Wade Sur., Lot 27. Loc.
Humble O. & R. Co.'s No. 1 A. M. Smith, W. D. C. Hall Sur. R.U.
Glenn McCarthy's No. 1 E. W. K. Andrau, H.T.&B. Sur. 5. Drlg. 155 ft.
Glenn McCarthy No. 1 Houston Farm Dev., James F. Perry and E. Austin Sur. 7. T.D. 10,350 ft. (cor.): flwg. 32 bbl. dist. per day; ¾-in. ck.; killed; prep. to recomp.
Glenn McCarthy's No. 2 Houston Farm Dev. Co., J. Perry & E. Austin Sur. 7 10¾-in. csg. 3,492 ft.; drlg. sh. 6,625 ft.
Mayo & Frazier's No. 1 Darrington, State Prison Farm, A. McFarlan Sur. R.U.
Titanic Oil Co.'s No. 1 Allen, J. G. and G. W. McNeel Lge. (Allen dome). Drlg. sh. 3,000 ft.

Chambers County

Geo. Anderson No. 1 Julia Casey, W. D Smith Sur. Loc.
J. R. Turnbull's No. 1 Kirby Lbr. Co., Chambers Co. Sch. Ld. Drlg. sh. 5,525 ft.
J. R. Turnbull et al No. 1 W. C. Shepherd, R. A. Porter Sur. T.D. 6,466 ft.: 7-in. csg. 6,429 ft.; flwd. oil, gas, and wash wtr.; sanded up; sdtrkd. 6,463 ft.; T.D. 6,700 ft.; P.B.; perf. 6,457-65 ft.; S.D.

Colorado County

Cockburn Oil Corp. No. 1 R. W. Ferris H. Chrisman Sur. Loc.

Fort Bend County

H. C. Cockburn's No. 1 G. W. Burkett, Bundieck Sur. Loc.
H. C. Cockburn No. 1 Dzierzanowski Emma Meyer Sur. 8. 10¾-in. csg. 1,058 ft.; T.D. 7,743 ft.; flwd. 85 B.F., 97% oil, 3% S.W.; ¼-in. ck.
Gulf Oil Corp.'s No. 1 Russell Brown, William Pettus Sur. Loc.
Magnolia Pet. Co.'s No. 1 G. H. Huntington, Henry Scott Sur. T.D. 2,537 ft.; rmg.

Galveston County

Sun Oil Co.'s No. 1-176 State. Drlg. sdy. sh. 6,310 ft.

Grimes County

Roan, Coker & Kile's No. 1 W. W. Greer, Patrick B. O'Connor Sur. 10¾-in. csg. 41 ft.; drlg. sd.&sh. 2,175 ft.

Harris County

Temple Hargrave's No. 1 Herman Hospital, Wm. Hardin Sur. Loc.
Dick Schwab's No. 1 W. H. Robertson, Andrew Lawson Sur. Drk.
McDannald Oil Co.'s No. 1 C. Brown, H. T.&B. Sur. 7. R.U.
L. R. Wilhite et al No. 1 Houston-Harris Co. Ship Channel, Nav. dist., Ezekiel Thomas Sur. 13-in. csg. 388 ft.; S.D 2,600 ft.

Jackson County

Skelly Oil Co.'s No. 1 Kunover, Schwind & Mahers subd., Blk. 4 (Francitas field). Cg. 8,530 ft.

Jefferson County

I. E. Harwell No. 1 State, Gulf of Mexico. T.D. 5,840 ft.; D.S. stk.; pulled in two; S.D.

Matagorda County

Gulf Stream Oil Co.'s No. 1 G. W. Ziprian, Luke Lessassier Sur. Drk.

Montgomery County

David B. MacDaniel's No. 1 Hattie O. Baldwin, Walker Co. Sch. Ld. Sur. R.U.

Orange County

American Eagle Oil Co. No. 2 Geo. Pell, Geo. A. Patillo Sur. Loc.

Polk County

Patrick-Tyrell Drlg. Co. No. 1 O. L. Jackson, C. Devore Sur. Loc.

San Jacinto County

F. J. Hynes No. 1 Foster Lbr. Co., M. Brown Sur. Rig.
F. J. Hynes No. 2 Foster Lbr. Co., M. Finch Sur. Loc.

Tyler County

Oil Equity Corp.'s No. 2 Kountz, E. Smith Sur. Loc.

Washington County

Mount Selman Oil Co. No. 1 Fritz Fuelberg, W. Lightfoot Sur. Drlg. sh. 2,580 ft.

Wharton County

Sam G. Harris et al's No. 1 C. T. Kountz, A.T.R.R. Sur., Sec. 51. Drlg. sd.&sh. 90 ft.
Dr. T. M. Neal No. 1 fee, Elisha Flack Sur. Loc.
Sun Oil Co.'s No. 1 Winnie M. Pool, G. H.&R.R. Sur. Drlg. sh. 6,132 ft.

S. W. TEXAS WILDCATS

Aransas County

Continental Oil Co.'s No. 1 St. Charles Co., R. D. Blassman Sur. 18⅝-in. csg. 290 ft.; drlg. sh. 7,769 ft.

Bastrop County

C. R. Franklin's No. 1 Oscar McDonald, Martha Barker Sur. Drk.
Marts & Beaven's No. 1 J. E. Ferguson, Jas. Doyle Sur. S.D. 1,600 ft.

Bee County

J. R. Dougherty's No. 6 Hicks, J. M. Uranga gr. Drlg. sh. 3,516 ft.
Mills Bennett Prod. Co.-Anderson-Prichard Oil Corp.'s No. 1 D. E. Robinson, J. M. Uranga. Sur. Drlg. sd.&sh. 4,109 ft.

Bell County

G. P. Shelton et al No. 1 Nelson, Michael Griffin Sur. S.D. 1,208 ft.

Bexar County

J. A. Tarver's No. 1 Florence Lam, Manuel de Luna Sur. 3. T.D. 1,632 ft.; 6⅝-in. csg. 1,205 ft.

Blanco County

E. L. Nixon's No. 3 Crist, John McClenechen Sur. 94. S.D. 50 ft.

Brooks County

Magnolia Pet. Co.'s No. 1 Vivian Rust, La Gloria townsite subd. Drlg. sh. 5,186 ft.

Caldwell County

Dr. J. F. Atha's No. 1 G. W. Carter, Gideon Pace Sur. T.D. 1,793 ft.; 7-in. csg. 1,744 ft.; swbg.; showing some oil. R.U. to pmp.

Calhoun County

Coronado Corp. No. 1 K. Welder, Hidalgo Sur., 3 mi. SE Seadrift. Drlg. sh. 8,176 ft.

Cameron County

Sal Vieja Oil Co. et al's No. 2 Gatewood Newberry, San Martin gr. Drlg. sh. 8,110 ft.

De Witt County

Atlantic Ref. Co.'s No. 1 Pearl Conwell, Chas. Lockhart Sur. Loc.
Marshall Purvis No. 1 Afflerback, L. W. Criswell Sur. T.D. 6,450 ft.; P.B.; sdtrkd.; drlg. sh. 6,395 ft.; (cor.).

Duval County

W. L. Catlin et al No. 1 Louis Escapule, J. Poitevent Sur. No. 73. Loc.
Magnolia Pet. Co.'s No. 1 D.C.R.C., J. Poitevent Sur. T.D. 2,735 ft.; abd.
Ownby Drlg. Co.'s No. 1 Hinojosa, A.B. &M. Sur. 131. T.D. 4,255 ft.; abd.
Standard Oil Co. of Texas' No. 1 Jack Casey, San Pedro de Charco Redondo gr. T.D. 6,746 ft.; 7-in. csg. to test 6,722 ft.; perf. csg. 5,334-45 ft.; tstd. gas and dist.; run tbg. to comp.

Falls County

J. Shaunfield No. 1 Barganier, J. M. Graham Sur. T.D. 1,195 ft.; Buda L.; S.S.O.; waiting on csg.

Goliad County

D. C. Matthews et al's No. 2 G. J. Swickheimer, Wm. Patterson Sur. (Fannin field). Drlg. sh. 3,089 ft.

Gonzales County

Mudge Oil Co.'s No. 1 T. G. Edwards-Wesley, W. Pace Sur. T.D. 1,599 ft.; abd.
J. A. Walker et al's No. 1 C. L. Dubose, E. C. Coffman Sur. Drlg. sh. 209 ft.
E. E. Young No. 1 Moore, D. O. Warren Sur. Drlg. sd. 2,994 ft.

Guadalupe County

Burton-Garvin & Womack's No. 2 Henry Weil, E. de Los Santos Coy Sur. No 93. R.U.

Jim Hogg County

W. C. Gray et al's No. 1 Rosa Palacios, G. W. Waddell Sur. S.D. 50 ft.
Mayfair Oil Corp.'s No. 1 I. R. Gutierrez, C. Gutierrez Sur. 164. Spd. and S.D.
C. A. Nibert et al's No. 1 Yeager Sur. 20. S.D. 1,316 ft.

Jim Wells County

Austin Pet. Co. No. 1 H. M. Reed (8 mi. NW Orange Grove), J. Poitevent Sur. Cmtd. surf. pipe 190 ft.; S.D. 210 ft.
Rodney DeLange et al's No. 1 Maggie McNeill. Benito Lopez de Jean gr. Tstd. 450 lb. pres.: D.S.T. 4,762-80 ft.; T.D. 5,410 ft.; 5½-in. csg. 4,880 ft.; perf. csg. 4,786-90 ft.; flwd. 63 bbl. dist.; 20 hrs.; 7/64-in. ck.; T.P. 1,750 lb.; C.P. 1,900 lb.; S.I.; sqzd. perf.
H. H. Howell et al's No. 1 N. Hinojosa, S.K.&K. Sur., Sec. 229. Spd.
Magnolia Pet. Co.'s No. 1 C. C. Hornsby, Los Olmos y Loma Blanca gr. Drlg. sh. 6,110 ft.
Magnolia Pet. Co.'s No. 1 W. C. Hornsby (La Gloria field). Drlg. sh. 3,216 ft.
Magnolia Pet. Co.'s No. 1 E. H. Stolze et al, Los Olmos y Loma Blanca gr., Lot 16, Blk. 10. Drlg. sh. 6,450 ft.
V. J. Meyer and V. F. Simon's No. 2 Shear, A.B.&M. Sur. (Magnolia City field). Drlg. sh. 3,320 ft.
Parr & Delaney Oil Co. et al's No. 1 P. Garcia, La Anima Solo gr. T.D. 5,651 ft.; abd.
Trinity Drillers et al's No. 1 Temple Lbr. Co., Los Presenos de Arriba gr. Loc.

Karnes County

Clyde Eckols' No. 1 J. M. Newberry, Carlos Martinez Sur. Spd.

Kendall County

C. M. Dewey's No. 2 Seidensticker, R. Davis Sur. No. 20. S.D. 714 ft.

Kimble County

A. L. Bierschwale's No. 1 F. W. Kraeke, Sur. 366. Drlg. L. 407 ft.
W. S. Kelly No. 1 A. L. Bierchwale. D Lloyd Sur. S.D. 135 ft.; abd.
C. H. Wolff & M. C. Moore No. 1 W J Wilkinson, Brook & Burleson Sur Sec. 24. S.D. 20 ft.

Kleberg County

Humble O. & R. Co.'s No. 1 M. Garza, Rinconde Santa Gertrudis gr. Drlg. sh. 6,518 ft.
Pure Oil Co.'s No. 1 State, Tr. 171 (Bird Island field). Drlg. sh. 7,310 ft.

La Salle County

John Vivian's No. 1 Louis Yeager, A.B. &M. Sur. 53. Drlg. 290 ft.

Lavaca County

Midway O. & R. Co.'s No. 1 Annie Schumacher. T. Wlx. 6,339 ft.; S.D. 6,851 ft.

Lee County

Fred Pederson et al No. 1 Brown, David Hudson Sur. Drlg. L. 6,605 ft.

Live Oak County

A. R. Pohler's No. 1 A. J. Turner, Stephen Hays Sur. S.D. 899 ft.
L. W. Stieren's No. 3 Lange, Thos. Adams Sur. T.D. 1,497 ft.

McMullen County

J. C. Carter's No. 1 Thomas Franklin, E. L. Taylor Sur. 30. Loc.
Harrison & Ross' No. 1 T. A. Bracken, W. W. Allsberry Sur. 30. S.D. 825 ft.
Earl W. Rowe's No. 1 M. H. Reed, Seale & Morris Sur. 153. Spd.
C. D. Scarborough No. 1 First Natl. Bk. of Rosebud, Jas. Garner Sur. Drlg. sh. 1,560 ft.
Wellington Oil Co.'s No. 1 Sam Sanger, C. P. Smith Sur. 194. Cg. 2,130 ft.

Medina County

Elstone Oil Co.'s No. 1 Wm. Mann. J Campbell Sur. 24. T.D. 903 ft.; 8¼-in. csg. 635 ft.

Milam County

M. B. Cloud's No. 1-B Henniger, S. C Robertson Sur. 7-in. csg. 700 ft.; T.D. 777 ft.; pmpd. 1⅛ B.O. in 5 hrs.; pmpd. dry; abd.
M. A. Hays et al's No. 1 Sroboda, Wm. Punchard Sur. Drlg. sh. 1,283 ft.
W. H. Lawrence et al's No. 1 J. F. Bartek, Jose De Pena Sur. S.D. 1,015 ft.

Nueces County

N. W. Hunter et al's No. 1 A. R. Mantor, Briggs & Kuykendall subd., Blk. 23. T.D. 6,263 ft.; abd.
John Manley et al No. 1 Ruegg, Geo. H. Pauls subd. of Driscoll ranch. Loc.
Premont Pet. Co.'s No. 1 G. A. Langham, Los Sauces gr., Lot 12, Sec. 25. T.D. 5,240 ft.; tstd. 360 ft. oily mud. 30 ft. S.W.; T.D. 7,161 ft.; 7-in. csg. 5,681 ft.; perf. csg. 5,615-28 ft.; perf. csg. 5,069-79 ft.; rec. mud, gas, and S.W. on D.S.T.; perf. csg. 5,080-82 ft.; swbg.
Stanolind O. & G. Co.'s No. 1 Jennie Thompson, J. V. L. de Herrera gr. (Riverside field). Loc.

Refugio County

Hewitt & Daugherty's No. 3-A Rooke-Wagner, Jose Miguel Aldrete 4 Lge. and 1 Lge. gt. Drlg. sh. 2,260 ft.
Morgan Gulf Oil Corp.'s No. 1 J. M. Thomas, G. E. Cobian and Family Sur. Drlg. sh. 3,600 ft.
Norsworthy Prod. Co. No. 1 Wood, John Sinnott Sur. T.D. 6,508 ft. (cor.); S.D.
Rutherford & Royal O. & G. Co.'s No. 1 E. E. Swift, Esteben Lopez Sur. T.D. 6,515 ft.; abd.

San Patricio County

Diamond Half Oil Corp.'s No. 1 Walter F. Timon, San Patricio de Hibernia Sur. T.D. 6,027 ft.; abd.
Seaboard Oil Co.'s No. 1 M. C Smith, Juan Hart & Sons Sur. T.D. 7,296 ft.; 5½-in. csg. 7,108 ft.; perf. csg. 7,058-60 ft.; tstd. S.W.; perf. csg. 6,995-7,000 ft.; tstd. gas and dist.; perf. csg. 5,915-25 ft.; perf. csg. 5,380-88 ft.; flwd. S.W. on D.S.T.
Wellington Oil Co.'s No. 2-B Welder, Victoriano Tares & Pedro Villareal Sur. Drlg. sh. 5,970 ft.
Wellington Oil Co. No. 6 Welder, Hart Sur. (Angelita). T.D. 7,051 ft.; 5½-in. csg. 6,305 ft.; perf. csg. 6,225-35 ft.; I.P. 32 B.P.D.; pmpg.

Starr County

Hebert Aid's No. 1 M. Muniz, Jose F. Garza, Porc. 71. T.D. 715 ft.; abd.
Banks, Miller Oil Co.'s No. 1 McLean, Unit 3, Valle Del Rico Rio Grande subd., J. B. Villareal Porc. T.D. 2,756 ft.; cmtd. csg. 2,425 ft.; perf. csg. 2,316-24 ft.; rec. S.W.; abd.
C. L. Foster's No. 1 H. Garza, Juan Salinas, Porc. No. 71. S.D. 100 ft.
W. E. Gilbert's No. 1 Escobas, Jose F. Garza, Porc. 71. S.D. 106 ft.
Gilcrease Oil Co.'s No. 1 I. G. Gutierrez, J. LaGarza Falcon Porc. 104. S.D. 1,706 ft.
Lynes & Robertson's No. 1 Villareal, C. C.S.D.&R.G.N.G.R.R. Sur. 241. Loc.

Victoria County

Colton & Colton's No. 1 E. Terrell, A. Bideck Sur. Drlg. sh. 662 ft.
Houston Oil Co.'s No. 1 E. C. Dietzel, P. Gallardo Sur. Cg. sh. 2,890 ft.
Wellington Oil Co. et al's No. 1 J. W. Boothe, T.&N.O. Sur., Blk. 1, Sec. 10. Drlg. sh.&L. 7,150 ft.

Webb County

O. W. Killam's No. 1 fee, H.E.&W.T. Sur. 1859. T.D. 2,784 ft.; run 7-in. csg. abd.
W. C. McBride, Inc.'s No. 1 Manuel Vela, C.C.S.D.&R.G.N.G. Sur. 265. Loc.
Magnolia Pet. Co.'s No. 2 Garcia-Arriba Alberca De Arriba gr. Drlg. sd. 3,705 ft.
Mayfair Oil Corp.'s No. 3 Bruni, J. V. Borego gr. Loc.
J. R. B. Moore et al's No. 1 A. S. Billings, C.C.S.D.&R.G.N.G. Sur. 13. Drlg. sh. 1,951 ft.
Tide Water Asso. Oil Co. No. 7 Bruni Blk. 7, M. Arispe gr. (deep test Bruni field). Drlg. sh. 7,250 ft.

Williamson County

Brown-Gardner et al's No. 1 G. W. Griffin, Harrison Owens Sur. S.D. 2,214 ft.
Knisely, Aldridge, Cockburn's No. 1 D. M. Sloan, J. W. Baker Sur. 2. S.D. 1,010 ft.; Edw. L.

Zapata County

J. P. Martin et al's No. 1 Serapio Vela, El Grullo gt. Loc.
Joe Martinez No. 2 Bruni, J. V. Borego gr. T.D. 938 ft.; S.D.

WEST TEXAS WILDCATS

Brewster County

H. D. Wilcox's No. 2 Kokernot, Sec. 23 Blk. C, J. V. Massey Sur. S.D.O. 1,610 ft.

Cochran County

Atlantic Ref. Co.'s No. 1 Boyd, Labor 11, Lge. 56, Oldham C.S.L. Drlg. 3,643 ft.
Dean & Hyde's No. 1 Reed & Taylor, Sec. 21, Harrison & Brown Sur., SE of Duggan pool. Drlg. 310 ft.
Humble O. & R. Co. No. 1 J. Westheimer, Lab. 1, Lge. 146, Stonewall Co. Sch. Ld. Drlg. 7,308 ft.

Crane County

Gulf Oil Corp. No. 5 M. B. McKnight, Sec. 1, Blk. 21-B, P.S.L. Sur. Drlg. 5,421 ft.
Gulf Oil Corp.'s No. 12 Waddell, Sec. 30, Blk. 26-B, P.S.L. Sur. M.I.M.

Crockett County

Kimberlin's No. 1 J. W. Robbins, Sec. 4, Blk. B, G.C.&S.F. Sur. Straightening hole 147 ft.

Crosby County

Gulf Oil Corp. No. 1-C Swenson, Sec. 95, Blk. 2, H.&G.N. Sur. Drlg. 7,637 ft.

Dawson County

Ray Albaugh's No. 1 Dewey Hogg (O. W. D.D.). Drlg. 4,185 ft.

Ector County

I. T. I. O.'s No. 1-B Johnson, Sec. 39, Blk. 43, T.&P. Sur. Drlg. 3,798 ft.
Sloan & Zook No. 1 J. L. Johnson, Sec. 34, Blk. 43, T.&P. Sur. P.B. 4,167 ft.; tstg. 24 B.O.P.D.; P.B. 4,167 ft.; 19 B.O. and 16 B.W.; 6 hrs.; pmpd. 7 B. O. and 7 B.W. daily for 7 days; S.D.O.

El Paso County

Tri-State Oil Co.'s No. 1 Kimble, Sec. 237, A.T.&S.F.R.R. Sur. U.R. 2,133 ft.; no report.

Gaines County

Osage Drlg. Co.'s No. 1 G. D. Johnson, Sec. 268, Blk. G, W.T.R.R. Sur. Drlg. 5,312 ft.
Stanolind O. & G. Co.'s No. 1 American Warehouse, Sec. 5, D.&W. Sur., offset to No. 1 Rayner, discovery well. Bldg. road.
Stanolind O. & G. Co.'s No. 1 T. S. Riley, Sec. 11, Blk. H., D.&W. Sur. Loc.

Howard County

F. H. E. Oil Co. et al No. 2 D. H. Snyder, Sec. 21, Twp. 1s, Blk. 30, T.&P. Sur.; (extension). Tstg. 2,855 ft.; 100 B.O. and 6 bbl. wtr. per day.
M. L. Richards No. 1 Read, Sec. 36, Blk. 30, T.&P. Sur. S.D.O. 2,765 ft.

Hudspeth County

Haymon Krupp Oil & Ld. Co. No. 1 Thaxton, SE¼ Sec. 34, Blk. 74, Twp 6. S.G. 6,340-45 ft.; T.D. 6,402 ft.
Haymon Krupp No. 1 Briggs, Sec. 24, Blk. 73, Twp. 7, T.&P. Sur. S.D. 6,015 ft.

Irion County

P. I. Fox et al No. 1 J. M. Nutt, Sec. 5, Gonzales C.S.L. S.D.O. 335 ft.

Lynn County

John L. Baldridge No. 1 Alma Lbr. Co., Sec. 151, H.E.W.T. Sur. S.D. 4,430 ft.

Pecos County

Rockdale Oil Co. No. 1 A. Sullivan, Sec. 72, Blk. 10, H.&G.N. Sur. P. 90 B.O.P.D. 1,771-85 ft.; W.O.C. 1,717 ft.

Stanley Thompson No. 1 Elsinore Cattle Co., Sec. 54, Blk. D, G.C.&S.F. Sur. Drld. by 7,073 ft.; 500 ft. S.W. in hole; S.D.O. 7,342 ft.

Superior Oil Co. No. 1 V. W. Crockett-Continental Oil Co., Sec. 7, Blk. 110, T.C.R.R. Sur. C.&P.

Presidio County

Marfa Oil Co. No. 1 Fischer ranch, Sec 31, Blk. 8, G.H.&S.A. Sur. M.I.M.

Reeves County

T.A.T. Oil Co.'s No. 1 U. G. Orenderff, Sec. 10, Blk. 59, P.S.L. Sur. Loc.

Scurry County

Coffield & Guthrie's No. 1 Reiter, Sec 155, Blk. 97, A.&T.C. Sur. U.R. 10-in. csg. 524 ft.

Terrell County

E. M. Thomasson No. 1 Bates, Sec. 31 Blk. 1, H.&G.N. Sur. S.D. csg. 975 ft.

Tom Green County

Dan Short's No. 1 J. G. Davidson, NW part of Lovie P. Moore Sur.; 3,500-ft test. Drlg. 2,512 ft.

Upton County

N. A. Moore's No. 1 A. M. Mayhew, Sec 2, Blk. W, G.C.&S.F. Sur. S.D.O. 1,758 ft.

Ward County

Gulf Oil Corp. No. 5 Wristen, Sec. 18, Blk. 5, H.&T.C. Sur.; scheduled Ordovician test. Straightening hole; drlg. out 2,503 ft.

Magnolia Pet. Co.'s No. 2-43 Sealy, Sec 43, Blk. F, G.M.M.B.&A. Sur. Drlg. 2,905 ft.

Yoakum County

Sloan & Zook and T. N. Sloan's No. 1 J. E. Fitzgerald, Sec. 22, Blk. D, Gibson Sur., extreme NE cor. of county. W.O.R. 238 ft.

TEXAS PANHANDLE

Castro County

English et al No. 1 Gundlach, NW¼ Sec. 145, Blk. 6-M, S.K.&K. Sur. Loc.; no report.

Deaf Smith County

Uscan No. 1 Farwell, Sec. 18, Blk. 3, X Sur. C.O. 5,650 ft.

Hartley County

Phillips Pet. Co. No. 1 W. K. Gordon, Sec. 3, Blk. 44, H.&T.C. Sur. Drlg. 3,455 ft.; showed 34,300,000 cu. ft. gas below 3,415 ft.; drlg. 3,795 ft.

Lipscomb County

Phil O'Neil's No. 1 Jacob Koch, NW¼ SW¼ Sec. 539, T.&T.C.R.R. Sur. Drlg. 1,100 ft.

Ochiltree County

James R. Macon et al No. 1 W. R. Norris, SW SE Sec. 212, Blk. 43, H.&T.C. Sur. Bailing rotary fluid preparatory to resuming drlg. with C.T.; T.D. 6,274 ft. prep. acd. and test sec. at 5,000 ft.; est. 6,000,000 cu. ft. gas on D.S.T.; C.O. 5,000 ft.

Potter County

Les Whitaker No. 1 D. Pavillard, Sec 101, Blk. 2, A.B.&M. Sur. Drlg. 915 ft.

Sherman County

Hagy, Harrington & Marsh's No. 1 W. Freeman, Sec. 46, Blk. 2, G.H.&H Sur. Drlg. 1,700 ft.

I.T.I.O.'s No. 1 S. C. Bryant, NW¼ Sec. 369, Blk. 1-T, T.&N.O. Sur. Rig.

Wheeler County

Smith Bros. Ref. Co.'s No. 1 Ribble, Sec. 46, Blk. 5-A, H.&G.N. Sur. S.D. 4,135 ft.

E. C. TEXAS WILDCATS

Anderson County

A. Baggett's No. 1 J. R. Gillispie, J. R Ferguson Sur., 2½ mi. NE of Frankston. S.D. 4,350 ft.

R. H. Williamson No. 1 O. G. Rogers Wm. Greenwood Sur., 6 mi. SW of Elkhart. S.D. wtr. 3,450 ft.

Angelina County

Ginter Bros. No. 7 Copes Hrs., J. Morin Sur., 3 mi. E of Dibol. S.D. 800 ft.

K. L. McHenry's No. 2 Russell est., A. Flores Sur., 4 mi. N Lufkin. Prep. rng. csg. topped at 1,002 ft. 2 B.O. and 4 B. wtr. in 5 min.

Falls County

R. D. Salisbury No. 1 W. M. Shankle, J. A. Manchaca Sur., 1½ mi. NE Chilton. Recmtg. pipe 1,274 ft.

Fannin County

H. W. English's No. 1 T. W. Ayers, J. D. Seales Sur. S.D. 687 ft.

C. Newburn's No. 1 A. G. Allen, M. Caldwell Sur., 7 mi. NE of Banham. Drlg.

Freestone County

Brothers Oil Co.'s No. 1 P. D. C. Ball est., M. Rionda Sur., 5 mi. NW of Butler. Drlg. 5,505 ft.

Grayson County

Ross & Marshall's No. 2 E. Christman M. Ahult Sur., 5 mi. NW of Denison. S.D. 725 ft.

Rutledge Oil Co.'s No. 1 Williams, S. Nix Sur., 2 mi. NE of Van Alystine. Drlg. 3,607 ft.

Hill County

Carter-Bowland's No. 1 J. J. Atchison estate, E. Carrol Sur., 5 mi. W of Hillsboro. Drlg. 30 ft.

Houston County

J. C. Cook and Shell Oil Co.'s No. 1 B T. Masters, Levina Carpenter Sur., ⅛ mi. NW of Grapeland pool; 10,000-ft test. W.O.C. 1,009 ft.

Grapeland Oil Co.'s No. 1 Guice, J. D. J Procilla Sur., 2 mi. W of Grapeland Top. sd. 5,908 ft.; prep. comp. as distillate well.

J. C. Wynne et al's (Shell Oil Co., Inc.) No. 1 G. E. Dorsey, M. Sallas Sur., 2⅛ mi. S of Percilla; E 102 ac. of tr.; 10,000-ft. test. Drlg. 5,626 ft.

Hunt County

K. E. Jennings' No. 1 V. T. Banks, J. W. Haynes Sur., 5 mi. NE of Greenville; reinstated to test sec. at 2,114 ft.; S.D.W.O. 3,342 ft.

Westmount Oil Co.'s No. 1 Clark, W. H. Williams Sur., 1 mi. NW of Celeste. R.U.

Limestone County

Roy Handley's No. 1 W. E. McDaniel, A. Bass Sur., 1 mi. N of Prairie Hill. Drlg. 1,213 ft.

M. Samuel's No. 1 C. Barrow, W. G. McKinsey Sur., 4 mi. NW of Thornton. Prep. test.; T.D. 6,029 ft.

Navarro County

J. H. Burke's No. 1 fee, Edmonson Sur., 1 mi. N of Powell. M.I.M.

C. F. Carter's No. 1 Allen Eden, M. Shire Sur., 2 mi. NE of Angus. S.D. 775 ft.

Red River County

Dave Flesch's No. 1 Bailey, J. Robbins Sur., 1 mi. W of Bagwell. S.D. 2,538 ft.

Kansas-Oklahoma Pet. Corp. No. 1 [illegible] Ringwald, A. Moore Sur., 3 mi. W of Manchester. Drlg. 927 ft.

Rusk County

A. O. Whittington's No. 1 Kangerga Bros., Ign. Castro Sur., 9½ mi. N and slightly E of Pirtle. Bldg. drk.

Smith County

Dr. Grant's No. 1 J. W. Waters, J. Stapler Sur., 1½ mi. NE of Garden Valley. S.D. 5,000 ft.

Texas Co.'s No. 1 A. A. Scritchfield, D. Page Sur., 2 mi. NW of Bullard. Cmtg. pipe to D.D. 7,616 ft.

Trinity County

Gossage et al's No. 1 First Natl. Bnk., B. F. Wright Sur., S of Trinity. R.U. and S.D.

Van Zandt County

O. W. Killiam's No. 1 Republic Ins. Co., J. Salinga Sur., 2 mi. NE of Myrtle Springs. Drlg. 4,460 ft.

NORTH TEXAS WILDCATS

Archer County

W. B. Hamilton's No. 5 C. E. Graham, J. D. Young Sur. A-1249. Drlg. 4,282 ft.

Clay County

Continental Oil Co. et al's No. 1 O. O. Ross, W. Walker Sur. A-703. Set 158 ft. 10-in.; W.O.C.

Shell Oil Co., Inc.'s No. 1 Scaling, C of Blk. 87, J. H. Belcher Sur., 4 mi. S of Burns pool. S.D.O. 5,436 ft.

Cottle County

J. E. Burns et al No. 1 J. E. Moss, Sec. 5, Blk. L, A. Forsythe Sur. Jnkd. 225 ft.; skid 20 ft. S.; drlg. 1,165 ft.

Hardeman County

Amerada Pet. Corp. No. 1 W. M. Rice, Sec. 81, Blk. H, W.&N.W. Sur. Rng. elec. sur. 8,258 ft.

G. T. Kimble No. 1 M. T. Walling, SW¼ Sec. 368, Blk. H, H.W.&N.W. Sur., 5,500-ft. test. Drlg. 4,485 ft.

Jack County

Pitzer & West's No. 1 Sloan, Sec. 2786, T.E.&L. Sur. Drlg. 1,375 ft.

Montague County

Sackett and Continental No. 1 J. L. Brown, Sec. 58, E.T.R.R. Drlg. 5,220 ft.

Wilbarger County

Lawson & Leavall's No. X-1 W. T. Waggoner, NE¼ Sec. 37, Blk. 4, H.&T.C. R.R. Sur. Drlg. 1,729 ft.

Young County

Taubert & McKee Drlg. Co.'s No. 1 Shanafelt, P. Pointevent Sur., Abst 1309. 6⅝-in. 4,012 ft.; drlg. 4,437 ft.

EAST TEXAS

(Border Counties)

Cass County

G. Scott Hammond's No. 1 Price, C S½ W 40 acres, 125-acre tr., Chas. Ames Sur. 10¾-in. csg. 1,045 ft.; T. Gloyd 5,860 ft.; por.; cleaned hole; set 5½-in. csg. 5,865 ft.; tstd. 1,000,000 cu. ft. gas; csg. leaking; acdzg.; T.D. 5,955 ft.

Marion County—Other

Otto Davis' No. 1 Hart, Gaines Coore Sur. Set 10-in. csg. 22 ft.; W.O.C.

M. D. Fitzwater No. 1 Mrs. Mary Duncan, Jesse Fitzgerald Sur. T.D. 2,538 ft.; swbd. and bailed dry; tstg.

J. D. Reynolds' No. 2-B Terry est., W. Coore Sur. T. Tokio 2,333 ft.; T.D. 2,380 ft.; flwd. 40 B.P.H. for 2 hrs. and went dead; W.O.S.R.

J. D. Reynold's No. 3-B Terry est., 660 ft. EL, 2,250 ft. SL, W. Coore Sur. M.I.M.

Sutton et al's No. 1 W. Taylor, 450 ft. EL, midway N and SL, B.B.B.&C.R.R. A-54 Sur. Set 6-in. csg. 2,289 ft.; T.D. 2,313 ft.; pulled lnr.; swbg. some heavy oil.

Marion County—Rodessa

Ark. La. Gas Co.'s No. 2 W. T. Neilson, 1,320 ft. N line, 620 ft. SE line, R. Bennington Sur. Drlg. L.&sh. 5,255 ft.

Gulf Oil Corp.'s No. 3 Ray, 514 ft. NL, 641 ft. EL, 65-ac. tr., J. Hanks Sur. Drlg. 2,045 ft.

C. H. Lyons' No. 1 Jackson, 473 ft. NL, 460 ft. WL, 20-ac. tr., J. Hanks Sur. Drlg. sh. 3,275 ft.

Shell Oil Co., Inc.'s No. 3 Whelan, 330 ft. S and W line tr., T. Gillespie Sur. Drlg. sh. 2,730 ft.

Crude-Oil Price Changes

Effective October 21 Sohio Corp. increased its price paid for crude oil in the Salem field in Illinois 10 cents per barrel, making its price $1.05 per barrel.

Effective October 23 Standard Oil Co. of Louisiana posted the Bunkie and Eola, Louisiana, pools as follows: Below 25 gravity, 83 cents; 25-25.9 gravity, 85 cents, with 2 cents added for each degree up to and including 40 gravity and above at $1.15, a 10-cent increase.

CRUDE-OIL PRICES IN REPRESENTATIVE FIELDS

Complete crude-price schedules are now being published in the first issue of each month. The last complete schedule was published in the October 5 issue. All changes in crude-oil price schedules will be published completely in the first issue following the announcement of the changes. Following are representative crude-price schedules in barrels (42 gal.):

East Texas	$1.10
Conroe	1.27
Tepetate, La.	1.03
Smackover, Ark., heavy	.73
Illinois basin	1.05
Pecos County, Tex.	.78
Lance Creek, Wyo.	.77
Bradford, Pa.	2.25

Gravity Schedule

Top prices include all gravities above grades designated and low prices include all gravities below grades designated:

	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Texas
14-14.9	$.80	...	...
15-15.9	.80	...	...
16-16.9	.80	...	...
17-17.9	.80	...	...
18-18.9	.80	...	...
19-19.9	.82	...	$.86
20-20.9	.85	$.70	.88
21-21.9	.88	.72	.90
22-22.9	.92	.74	.92
23-23.9	.95	.76	.94
24-24.9	.99	.78	.96
25-25.9	1.03	.80	.98
26-26.9	1.06	.82	1.00
27-27.9	1.10	.84	1.02
28-28.9	1.14	.86	1.04
29-29.9	1.17	.88	1.06
30-30.9	1.21	.90	1.08
31-31.9	...	.92	1.10
32-32.9	...	.94	1.12
33-33.9	...	.96	1.14
34-34.9	...	.98	1.16
35-35.9	...	1.00	1.18
36-36.9	...	1.02	1.20
37-37.9	...	1.04	1.22
38-38.9	...	1.06	1.24
39-39.9	...	1.08	1.26
40-40.9	...	1.10	1.28

Texas Co.'s No. 6 Braden, J. M. Fitzgerald Sur. Drlg. sh.&L. 4,856 ft.

Shelby County

Natural Gas Dist. Corp.'s No. 1 W. B. Childress, 1,000 ft. W of Redditt & Gray's No. 2 Pickering, W. M. Snider Sur. Drlg. 4,913 ft.

WEST CENTRAL TEXAS DISTRICT

Brown County

Kynaston & Cullison's No. 1 L. A. Hill, SW¼ Sec. 35, H.T.&B. Sur. Drlg. 410 ft.

Callahan County

Kendrick & Van Zandt's No. 1 A. W. Johnson, SE cor NE¼ Sec. 62, L.A.L. Sur. Drlg.

Eastland County

Dobbs Oil Corp.'s No. 1 Pierce, 330 ft. SL and 330 ft. EL of 214-ac. tract in Sec. 35, Blk. 2, H.&T.C. Survey. Drlg. 800 ft. last report.

Lone Star Gas Co.'s No. 1 F. J. Kimmel, Sec. 87, Blk. 4, H.&T.C.R.R. Sur. Drlg. 1,510 ft.

Jones County

Moutray-King Oil Co.'s No. 1 J. B. Rutledge, Subd. 33, Sec. 2, Blk. 20, T.&P. Sur. Drlg. 1,732 ft.

A. H. Tarver No. 1 A. S. Barkley, Sec. 54, Deaf and Dumb Asyl. Lds. Drlg. 5,265 ft.

Nolan County

Green & Owens' No. 1 Tipton, Sec. 43, Blk. 19, T.&P. Sur. Sat. from 5,135-38 ft.; 116 B.O. in 2 hrs.; est. 450 B.O. P.D.; tstg.

Plymouth Oil Co. No. 1 F. M. McClure, Sec. 49, Blk. 23, T.&P. Sur., 8,000-ft. test. Drlg. 4,600 ft.

Palo Pinto County

J. Jones' No. 1 R. H. Gauldin, NW cor. Sec. 1743, T.E.&L. Sur. Drlg. 200 ft.

Stephens County

Geo. E. Fagg No. 1 Richardson, Sec. 8, Blk. 31, S.P.R.R. Sur.; 4,000-ft. test. Drlg. 2,397 ft.

T. G. Shaw, Tr.'s No. 1 S. P. Stroud, NW¼ of G. Newton Sur., Abst. 128, Sd. 2,597-2,600 ft.; drlg. plug.

A. G. Swanson No. 1 Veale-Frost, Sec. 37, Blk. 8, T.P. Sur. Drlg. 3,780 ft.

Stonewall County

Shell Oil Co., Inc., No. 1 A. E. Smith, Sec. 143, Blk. 1, H.&T.C. Sur.; 6,000-ft. test. Drlg. 3,062 ft.

PIPE LINE

DESIGN
SURVEY
and
CONSTRUCTION
●
INVENTORY
and
APPRAISAL

MIDWESTERN
Engineering
AND CONSTRUCTION COMPANY
McBirney Bldg., Tulsa, Oklahoma
Floyd E. Stanley, Pres. & Gen'l. Mgr. — C. Clark Bledsoe, Sec. & Treas.

Oklahoma Fields

(Continued from Page 155)

1s-5w, an old well, was deepened from 388 ft. to 637-650 ft., total depth, and pumped 4 bbl. of oil daily. Wirt Franklin's No. 8-A-F, NW NE NE Section 21-1s-4w, an old well, was plugged back from 3,351 ft. to 2,453 ft., acidized, water intruded and it was abandoned.

Armour's No. 1 Dow, CSL NW NW Section 30-1n-8w, North Duncan area, had dry sand at 1,185-97 ft., total depth, and was abandoned.

In Cotton County, Shasta Oil Co.'s No. 1 Ta-hi, NW NW SE Section 31-1s-9w, Walters field, was drilling below 1,584 ft.

Grady County

Cooke's No. 1 Bryan, SW NE SE Section 8-3n-5w, Knox field, Grady County, was temporarily abandoned after plugging back from 2,808 ft. to 2,337 ft.

McCasland's No. 1-A Wallford, SE NW SW Section 16-3n-5w, was dry and abandoned at 2,721 ft., total depth.

Same operator's No. 1-A Burkes A, SE SE NE Section 17-3-5w, was bottomed at 2,834 ft., plugged back to 2,388 ft. and was temporarily abandoned.

Ohio Fields

(Continued from Page 148)

Township Guy Shrider and others' No. 1 Minnie Rice, Section 24, found Clinton sand dry at a total depth of 2,738 ft. In Perry Township Earley Co.'s No. 2 Purley Fairall, Section 7, is a 4-bbl. pumper in the Berea at 693 ft.

In Meigs County, Rutland Township, T. J. Chase and others' No. 1 Birdie Lasher, Section 14, makes 250,000 cu. ft. of gas open flow from M-800 foot sand at 754 ft.

In Medina County, Chatham Township, Preston Oil Co.'s No. 6 Dan Gunkelman, Lot 6, Tract 16, made 65 bbl. of oil the first 24 hours after a shot in the Berea at 397 ft. In Spencer Township, McCrea Co.'s No. 2 C. Billman, Section 6, found the Clinton sand broken and dry; total depth 2,690 ft.

In Muskingum County, Union Township, Atha Co.'s No. 1 C. B. Baker, Section 15, had the top of the Corniferous lime at 2,980 ft. with a showing of oil in the Oriskany at 3,112-26 ft. It is estimated as a 5-bbl. well.

In Noble County. Wayne Township. Ohio Fuel Gas Co.'s No. 1 A. E. Bashford, Section 34, gaged 300,000 cu. ft. of gas from the Berea at 1,308 ft. In Buffalo Township H. P. McGinnis' No. 1 E. O. Bond, Section 29, is dry at 1,306 ft.

In Perry County, Monroe Township, Davis & Hazlett's No. 1 M. B. Penrod, Section 21, found Clinton sand dry, total depth 3,687 ft., abandoned.

In Stark County Jackson Township, Ohio Fuel Gas Co.'s No. 2 M. M. Rohr, Section 18, is a small gas well in the Clinton, gaging 220,000 cu. ft. at 4,112-25 ft.

In Washington County, Barlow Township, Anderson Co.'s No. 4 Blanche Turner, Section 4, gaged 400,000 cu. ft. of gas, open flow in the Injun at 1.545 ft.

The dry Oriskany test in Morgan County, Meigsville Township, drilled by C. Foraker and others, is being deepened to the Clinton sand.

Lima Field

No completions were reported in the Trenton area. One new sub-Trenton test has been staked by Sun Oil Co. on the Ed M. Marshall farm in Greene County, 7 miles southeast of Xenia and 2 miles west of State Route No. 68, in Military Survey No. 2238.

California Fields

(Continued from Page 161)

field, the lone incompleted drilling well being No. 100 Reyes of Shell Oil Co.

Arvin

Two new wells were completed in the Arvin field of Kern County but one of them, No. 2 Jewett of Texas Co., was an outpost in Section 16-31-29 and was good for only 70 bbl. of 29.9-gravity oil per day from 6,055 ft. This new well, which tested wet on the first production test last week, is cutting 5 per cent. No. 5 Jewett of Standard Oil Co. started off flowing 1,135 bbl. of 34.2-gravity oil through a 62/64-in. bean from a depth of 6,080 ft. Tubing pressure is 1,300 lb. and casing pressure is 1,350 lb. In addition to the oil, No. 5 Jewett is making 19,500,000 cu. ft. of gas daily. Shortly after completion the bean was reduced to 18/64-in. with the result that crude-oil production was reduced to 280 bbl. daily and gas volume declined to 3,350,000 cu. ft. daily. Richfield Oil Corp. has the only incompleted drilling project in the Arvin field at present and from present indications all operators will hang up tools until after the advent of the new year.

Coastal District

In the prolific Ventura Avenue field, Shell Oil Co., Inc., completed No. 102 Taylor flowing 2,038 bbl. of 34.4-gravity oil and 4,401,000 cu. ft. of gas per day from 7,706 ft. This new well was finished with a 7⅝-in. water string cemented at 6,195 ft. and 1,557 ft. of 5½-in. liner landed at 7,703 ft. and perforated at 7,115-7,703 ft. The cement job was through perforations at 7,112 ft.

West Texas Fields

(Continued from Page 142)

Young County line. Taubert & McKee were swabbing approximately 100 bbl. of oil daily from No. 1 Shanefelt. Sand was found at 4,400 ft. and drilled to 4,410 ft. where a lime stringer was found. More saturated sand was penetrated in drilling below 4,410 ft. and at last report the crew was attempting to drill deeper below 4,435 ft., total depth.

Nolan County's new pool opener is declining in output. Green & Owens' No. 1 S. C. Tipton, discovery well 3 miles southwest of Trent and in Section 43, Block 19, T.&P. Survey, was last reported swabbing at a total depth of 5,140 ft. In the last 70 hours the recovery was 160 bbl. of oil and 41 bbl. of water. In the last 24 hours of that time the outpost was 3½ bbl. of net oil hourly. The pay section was encountered from 5,135 to 5,138 ft.

Considerable activity was seen in Shackelford County. A location was staked for a 4,800-ft. test and a 1½-mile-northeast outpost staked to the county's 1,250-ft. Cook-sand pool. The deep wildcat is Georgian Oil Corp.'s No. 1 Blach Brothers, in the east part of the T.E.&L. Survey and on the 7,500-acre Blach ranch. It will be one of the deepest wells drilled in that part of the county. George Callihan, drilling contractor of Albany, is moving in materials. An attempt to pick up the 1,250-ft. pay of Shackelford County's old Cook pool is being made by Dickey Brothers at a wildcat started on the W. I. Cook estate, northeast half of the I.&G.N. Survey, 1½ miles northeast of the pool proper. The test, on the east side of the 18,000-acre ranch, is 1 mile northeast of the first test drilled on the ranch by Roeser & Pendleton in 1925, which was abandoned at 3,008 ft.

Two closely watched wildcats in Jones County continued to drill ahead as the week closed. Seeking to tap Palo Pinto-lime production in the Sandy Ridge area in the southeastern part of the county, W. F. Snebold and Tom B. Owens were drilling below 1,200 ft. in No. 1 Jeffreys, NE¼ Section 7, Block 15, T.&P. Survey, ¼ mile west of production in the Sandy Ridge pool. The Jones County wildcat being drilled by Bert Fields for the Hickok & Reynolds Co. in the Williams lands, southwest of the Avoca townsite (Griffin) pool was last reported preparing to halt drilling to test an oil showing at 3,271 ft. It is not determined whether the showing is in the Palo Pinto lime. Location is just outside of the townsite of Avoca on the west side of the pool.

WEST TEXAS FIELD COMPLETIONS

(24-hour gages)

Andrews County

In the Means pool Humble Oil & Refining Co.'s No. 67 J. S. Means, 4,500-50 ft., 393 bbl. Humble Oil & Refining Co.'s No. 68 J. S. Means, 4,500-17 ft., 1,262 bbl.

Crockett County

In the Crockett pool Gilcrease Oil Co.'s No. 5-16 University, 1,420-1,495 ft., 55 bbl. (old well drilled deeper).

Ector County

In the Foster pool Atlantic Refining Co.'s No. 1 F. A. Henderson, 3,995-4,200 ft., 828 bbl. Atlantic Refining Co.'s No. 1-E Johnson, 4,130-4,235 ft., 657 bbl. Atlantic Refining Co.'s No. 8-C Rumsey, 4,196-4,280 ft., 717 bbl. Broderick & Calvert's No. 12 Witcher, 3,900-4,185 ft., 1,566 bbl. Hilton Oils, Inc.'s No. 4 J. E. Witcher, 4,025-4,175 ft., 1,967 bbl. Stanolind Oil & Gas Co.'s No. 26-A E. F. Cowden, 4,025-4,160 ft., 1,008 ft. Stanolind Oil & Gas Co.'s No. 27-A Cowden, 4,035-4,180 ft., 672 bbl. Stanolind Oil & Gas Co.'s No. 26-B Cowden, 4,005-4,152 ft., 1,438 bbl. In the Harper pool Continental Oil Co.'s No. 4-C Kloh, 4,230-81 ft., 772 bbl. In the North Cowden pool Rushwold Oil Co.'s No. 3 Woods, 4,270-4,418 ft. ,2,799 bbl. Schermerhorn Oil Co.'s No. 2-C Johnson, dry and abandoned at total depth of 4,494 ft. Stanolind Oil & Gas Co.'s No. 18 Roberts, 4,215-4,445 ft., 584 bbl. Trans-Southern Petroleum Co.'s No. 1-B O. B. Holt, Jr., 4,115-4,385 ft., 190 bbl. In the Goldsmith pool Gulf Oil Corp.'s No. 221 Goldsmith, 4,175-4,195 ft., 60 bbl.

Gaines County

In the Wasson area Continental Oil Co.'s No. 6-51 Wasson, 4,976-5,080 ft., 220 bbl.

Howard County

In the Snyder pool Green Production Co.'s No. 1 Snyder, 2,706-3,150 ft., 6 bbl. Shasta Oil Co.'s No. 10 Texas Land & Mortgage Co., 2,750-2,830 ft., 1,393 bbl. A wildcat, Dick Graham's No. 1 Pete Johnson, dry and abandoned at total depth of 480 ft.

Pecos County

In the Tobarg area Childress Royalty Co.'s No. 26 Smith, 405-43 ft., 18 bbl. Childress Royalty Co.'s No. 27 Smith, 387-414 ft., 10 bbl. In the Yates pool Ohio Oil Co.'s No. 18-H Yates, 1,623-95 ft., 2,223 bbl.

Upton County

In the McCamey pool Ellis & Peters' No. 7-B Robbins, 2,313-50 ft., 67 bbl., (old well drilled deeper). Lee Petroleum Co.'s No. 3 Burleson, 2,407-32 ft., 198 bbl.

Ward County

In the Estes pool Gulf Oil Corp.'s No. 123 Estes, 2,518-2,689 ft., 4,572 bbl. In the Sealy pool Ward-Pecos Petroleum Co.'s No. 4 Texas Cotton Industries, 1,885-1,900 ft., 261 bbl.

Yoakum County

In the Wasson-Bennett pool Aloco Oil Co.'s No. 1 I. N. Greer, 4,945-5,200 ft., 1,380 bbl. Continental Oil Co.'s No. 2-A Stevens, 4,930-5,130 ft., 817 bbl. Don Danvers' No. 5 Clawater-Amerada, 4,941-5,175 ft., 811 bbl. Honolulu Oil Corp.'s No. 2-804 Wilder, 4,940-5,160 ft., 1,290 bbl. J. E. Mabee's No. 11 Willard, 4,995-5,220 ft., 1,266 bbl. Magnolia Petroleum Co.'s No. 6 Kendrick, 4,985-5,150 ft., 1,299 bbl. Milhoan Production Co.'s No. 5 Willard, 4,912-5,160 ft., 1,441 bbl. Oil Development Co. of Texas' No. 1-761 fee, 4,913-5,215 ft., 2,145 bbl. Oil Development Co. of Texas' No. 2-803 fee, 4,903-5,215 ft., 1,051 bbl. Oil Development Co. of Texas' No. 5-803 fee, 4,913-5,215 ft., 1,244 bbl. Texas Pacific Coal & Oil Co.'s No. 24 Bennett, 5,050-5,220 ft., 959 bbl.

PANHANDLE COMPLETIONS

Armstrong County

A wildcat, Holmes, Newblock & Haley's No. 1 E. J. Moore, dry and abandoned at total depth of 4,507 ft.

Gray County

Shell Oil Co., Inc.'s No. 15 Haggard, 3,200-58 ft., 408 bbl.

Hutchinson County

Marlow Oil Co.'s No. 4 J. J. Perkins A, 2,942-87 ft., 148 bbl. Phillips Petroleum Co.'s No. 1 Erle, 2,944-3,018 ft., 226 bbl.

Moore County

Texoma Natural Gas Co.'s No. 21-P J. T. Sneed, 2,535-2,735 ft., 34,300,000 cu. ft. of gas.

WEST CENTRAL TEXAS COMPLETIONS

Callahan County

Warren and others' No. 1-B Clinton, 1,661-71 ft., 10 bbl. daily.

Coleman County

Coleman Oil & Gas Co.'s No. 1 Garland Powell, 2,200-70 ft., 5,000,000 cu. ft. gas.

Jones County

Humble Oil & Refining Co.'s No. 17 Hollums, 3,242-45 ft., 1,500 bbl. Hickok & Reynolds' No. 1 C. W. Williams, temporarily abandoned at 3,373 ft.

Shackelford County

Danciger Oil & Refining Co.'s No. 8 McCown, 3,186-95 ft., 720 bbl., natural. Algord Oil Co.'s No. 6 E. P. Swenson, 3,185-92 ft., 600 bbl., natural.

Summary of Operations, All Fields, September

SUMMARY OF ALL FIELDS

	Comp.	Prod.	Dry	Gas
Eastern fields	442	1,031	35	87
Lima	2	35	0	0
Central Ohio	84	412	31	44
Indiana	43	6,433	17	2
Western Kentucky	33	821	17	1
Eastern Kentucky	29	79	5	17
Michigan	127	34,440	54	5
Illinois	314	75,046	54	2
Kansas	131	44,411	27	16
Oklahoma	106	14,868	29	4
N. Central Texas	196	88,963	71	3
West Texas	179	144,652	11	0
Texas Panhandle	44	12,049	3	4
East Texas	21	998	1	0
East Central Texas	24	1,990	10	3
East Texas Border	7	850	2	2
Gulf Coast Texas	128	25,435	25	9
Southwest Texas	165	12,256	42	16
Arkansas	21	7,235	4	1
North Louisiana	42	3,210	13	11
Gulf Coast La.	80	17,155	17	1
Mississippi	1	185	0	0
Missouri	8	0	5	3
Montana	10	281	2	1
Wyoming	19	13,459	7	1
New Mexico	43	17,734	4	2
Colorado	2	130	0	0
Total Sept.	2,301	524,158	486	235
Total Aug.	2,265	450,544	585	206
Difference	36	73,614	99	29

Rigs and Wells Drilling

	Rigs	Dlg.	Ttl.
Eastern fields	85	438	523
Lima	1	6	7
Central Ohio	24	138	162
Indiana	11	66	77
Western Kentucky	0	67	67
Eastern Kentucky	11	38	49
Michigan	24	160	184
Illinois	78	377	455
Kansas	31	169	200
Oklahoma	35	281	316
N. Cent. Texas	86	202	288
West Texas	61	268	329
Texas Panhandle	10	86	96
East Texas	9	13	22
East Central Texas	11	31	42
East Texas Border	7	7	14
Gulf Coast Texas	24	102	126
Southwest Texas	35	164	199
Arkansas	22	27	49
North Louisiana	21	42	63
Gulf Coast Louisiana	15	127	142
Mississippi	10	5	15
Missouri	1	21	22
Georgia	1	0	1
Florida	1	6	7
Iowa	0	2	2
Alabama	0	5	5
Montana	0	46	46
Wyoming	3	73	76
New Mexico	17	144	161
Utah	1	4	5
Colorado	2	40	42
Arizona	0	8	8
Nebraska	2	6	8
South Dakota	0	1	1
Total September	639	3,170	3,809
Total August	622	3,127	3,749
Difference	17	43	60

KANSAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Barber	1	0	0	1	0	1
Barton	10	5,588	2	1	5	15
Butler	4	75	3	0	0	7
Coffey	0	0	0	0	0	1
Comanche	1	0	1	0	0	0
Cowley	16	7,847	3	0	3	15
Dickinson	0	0	0	0	0	1
Douglas	1	0	1	0	0	1
Ellis	15	7,795	3	0	4	17
Ellsworth	4	546	2	0	0	3
Franklin	0	0	0	0	0	2
Greenwood	3	35	0	1	1	9
Harvey	1	146	0	0	0	1
Johnson	6	43	1	1	3	3
Kingman	0	0	0	0	0	2
Kiowa	1	0	1	0	0	0
Marion	3	425	0	0	0	4
McPherson	3	1,027	0	0	2	11
Osage	0	0	0	0	0	1
Miami	2	0	0	2	0	2
Pawnee	1	0	1	0	0	2
Pratt	8	772	1	6	0	3
Reno	0	0	0	0	0	2
Rice	16	3,598	4	0	3	25
Rooks	0	0	0	0	0	2
Rush	0	0	0	0	0	1
Russell	23	13,411	2	0	8	26
Sedgwick	0	0	0	0	0	3
Sherman	1	0	0	1	0	0
Stafford	7	3,103	1	0	2	5
Stevens	2	0	0	2	0	0
Sumner	0	0	0	0	0	2
Woodson	2	0	1	1	0	2
Ttl. Sept.	131	44,411	27	16	31	169
Ttl. Aug.	143	35,815	37	7	35	203
Difference	12	8,596	10	9	4	34

MISSOURI

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adair	0	0	0	0	0	3
Andrews	1	0	1	0	0	1
Bates	0	0	0	0	0	1
Bollinger	0	0	0	0	0	1
Buchanan	0	0	0	0	0	1
Carroll	1	0	0	1	1	0
Clay	2	0	2	0	0	1
Clinton	0	0	0	0	0	1
Daviess	0	0	0	0	0	1
DeKalb	0	0	0	0	0	1
Harrison	0	0	0	0	0	1
Holt	0	0	0	0	0	2
Jackson	1	0	1	0	0	1
Livingston	0	0	0	0	0	1
Mercer	0	0	0	0	0	1
Platte	2	0	0	2	0	1
Putnam	1	0	1	0	0	0
St. Charles	0	0	0	0	0	1
Schuyler	0	0	0	0	0	1
Shelby	0	0	0	0	0	1
Ttl. Sept.	8	0	5	3	1	21
Ttl. Aug.	7	0	7	0	3	22
Difference	1	0	2	3	2	1

OKLAHOMA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Alfalfa	1	0	1	0	0	0
Caddo	3	2,246	2	0	2	13
Canadian	0	0	0	0	0	1
Carter	6	132	1	0	1	6
Choctaw	0	0	0	0	0	2
Cleveland	0	0	0	0	0	3
Comanche	0	0	0	0	1	6
Cotton	0	0	0	0	0	1
Creek	18	553	6	0	3	39
Garfield	1	15	0	0	0	3
Grady	0	0	0	0	1	6
Greer	0	0	0	0	1	1
Hughes	0	0	0	0	0	3
Jackson	7	393	0	1	2	18
Jefferson	0	0	0	0	0	1
Kay	1	0	1	0	0	2
Kingfisher	0	0	0	0	0	2
Kiowa	1	0	1	0	0	4
Lincoln	4	145	0	0	1	6
Logan	0	0	0	0	0	2
Love	0	0	0	0	0	1
Marshall	0	0	0	0	0	3
Noble	1	0	1	0	0	4
Okfuskee	3	0	2	1	1	5
Oklahoma	2	89	1	0	0	3
Okmulgee	0	0	0	0	1	8
Osage	3	50	2	0	2	14
Pawnee	3	75	2	0	1	4
Payne	6	2,186	0	0	1	6
Pontotoc	11	1,122	2	0	5	13
Pottawatomie	17	6,024	3	0	5	31
Seminole	12	1,792	4	1	2	15
Stephens	5	44	0	1	0	12
Texas	0	0	0	0	1	0
Tillman	0	0	0	0	0	1
Tulsa	1	2	0	0	1	6
Washita	0	0	0	0	0	2
Eastern counties	0	0	0	0	3	34
Ttl. Sept.	106	14,868	29	4	35	281
Ttl. Aug.	164	13,210	63	15	46	290
Difference	58	1,658	34	11	11	9

SOUTHWEST TEXAS

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adami	1	60	0	0	0	2
Agua Dulce	7	0	0	7	1	2
Alice	2	206	0	0	0	6
Alta Vista	0	0	0	0	0	1
Angelita	0	0	0	0	0	1
Ben Bolt	3	486	0	0	0	3
Benavides	0	0	0	0	0	2
Banderia	0	0	0	0	0	1
Barbacoas	0	0	0	0	0	1
Bird Island	0	0	0	0	0	1
Byersville	1	5	0	0	1	0
Blas Uribe	0	0	0	0	0	2
Bruni	0	0	0	0	0	1
Buchanan	0	0	0	0	0	1
Carolina-Texas	0	0	0	0	0	1
Chacon Lake	2	6	0	0	0	0
Chiltipin	0	0	0	0	0	1
Clara Driscoll	1	0	1	0	0	0
Colorado	3	654	0	0	0	2
Coffey	1	0	1	0	0	0
Cologne	1	0	0	1	0	1
Cuevitas	1	38	0	0	0	0
Darst Creek	2	240	0	0	1	4
Driscoll	1	245	0	0	0	1
Dunlap	1	42	0	0	0	0
Dunlay	0	0	0	0	0	3
Escobas	2	0	2	0	1	1
Eagle Hill	1	0	1	0	0	0
E. Plymouth	1	0	0	1	0	0
E. White Pt.	13	1,915	0	0	1	12
E. Placedo	1	27	0	0	0	0
Ezzell	5	0	5	0	0	0
Fitzsimmons	3	258	0	0	0	2
Fannin	1	0	0	1	0	0
Greta	1	30	0	0	0	0
Gas Ridge	1	0	1	0	0	1
Heyser	2	190	0	0	0	2
Hoffman	3	121	0	0	0	4
Ina	1	40	0	0	0	1
Kelsey	8	796	0	0	0	2
Keeran	0	0	0	0	0	1
Kimbro	0	0	0	0	0	1
La Blanca	1	60	0	0	0	0
La Coste	0	0	0	0	0	1
La Gloria	1	54	0	0	1	2
La Rosa	4	467	0	0	0	2
Lomo Novio	0	0	0	0	0	1
Longhorn	3	357	0	0	1	2
London	1	0	1	0	0	0
Los Olmos	0	0	0	0	0	1
Luling	0	0	0	0	0	2
Luby	2	201	0	0	0	2
Lundell	1	3	0	0	0	1
McCampbell	8	695	0	0	1	5
McFaddin	0	0	0	0	0	1
Mirando Valley	0	0	0	0	1	1
Minnie Bock	7	747	0	0	2	3
Mtn. View	1	0	0	1	1	0
N. Killam	1	48	0	0	1	0
Oakville	1	0	0	1	0	1
Piedra De-Lumbre	3	224	0	0	1	0
Piedra Pintas	0	0	0	0	0	1
Plymouth	1	136	0	0	1	1
Rancho Solo	2	90	0	0	1	1
Refugio	1	194	0	0	0	0
Reynolds	6	645	1	1	0	5
Ricaby	1	0	1	0	0	2
Richard King	3	98	2	0	1	1
Riverside	1	0	1	0	0	1
Rincon	0	0	0	0	1	3
Rockdale	1	0	1	0	0	0
S. R. C.	2	64	0	1	0	1
Salt Flat	1	150	0	0	1	2
Samfordyce	2	238	0	0	1	1
Saxet	5	570	0	0	2	0
Seven Sisters	0	0	0	0	1	1
Southland	0	0	0	0	0	1
S. Clara Driscoll	2	162	0	0	0	2
S. Ricaby	1	112	0	0	0	1
Sun	1	70	0	0	0	1
Taft	0	0	0	0	0	1
Tomoconnor	3	1,365	1	0	0	2
Victoria	1	0	0	1	0	1
Volpe	1	65	0	0	0	0
Wade City	1	0	0	1	0	0
W. Cole	1	50	0	0	0	1
White Creek	1	38	0	0	0	1
Zoboroski	0	0	0	0	0	1
Miscellaneous	23	0	23	0	12	43
Ttl. Sept.	165	12,256	42	16	35	164
Ttl. Aug.	182	11,865	68	7	30	151
Difference	17	391	26	9	5	13

CENTRAL AND NORTH TEXAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Archer	26	20,599	5	0	14	28
Bosque	0	0	0	0	1	0
Brown	5	200	4	0	0	7
Callahan	5	81	4	0	2	5
Clay	9	187	5	0	2	6
Coleman	3	1,523	0	0	2	6
Comanche	1	3	0	0	0	2
Cooke	14	2,622	3	0	9	13
Coryell	0	0	0	0	1	1
Cottle	1	0	1	0	0	0
Denton	1	0	1	0	0	1
Erath	0	0	0	0	0	4
Eastland	1	0	1	0	2	4
Foard	1	0	0	1	0	0
Hamilton	0	0	0	0	0	1
Hardeman	0	0	0	0	0	3
Hood	0	0	0	0	0	1
Jack	12	2,516	8	0	7	11
Johnson	0	0	0	0	0	1
Jones	18	13,870	3	0	5	9
Mills	0	0	0	0	0	1
Montague	5	2,787	1	0	6	4
Palo Pinto	2	12	1	0	0	2
Parker	0	0	0	0	0	1
Shackelford	18	17,730	5	0	1	12
Stephens	0	0	0	0	2	4
Tarrant	0	0	0	0	1	1
Taylor	1	0	1	0	0	1
Throckmorton	1	0	1	0	0	1
Wichita	41	17,976	13	0	21	35
Wilbarger	5	2,908	2	0	4	9
Wise	1	0	1	0	0	5
Young	25	5,949	11	2	6	23
Ttl. Sept.	196	88,963	71	3	86	202
Ttl. Aug.	197	58,123	80	4	63	246
Difference	1	30,840	9	1	23	44

TEXAS PANHANDLE

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Armstrong	0	0	0	0	0	1
Carson	5	1,631	0	1	0	9
Deaf Smith	0	0	0	0	0	1
Dickens	1	0	1	0	0	1
Gray	19	6,062	0	0	6	24
Hartley	0	0	0	0	0	1
Hutchinson	11	3,989	0	0	2	29
Lipscomb	0	0	0	0	0	1
Moore	3	0	0	3	0	10
Ochiltree	0	0	0	0	0	1
Potter	1	0	1	0	0	1
Roberts	1	0	1	0	0	1
Wheeler	3	367	0	0	2	6
Ttl. Sept.	44	12,049	3	4	10	86
Ttl. Aug.	29	7,140	2	7	14	91
Difference	15	4,909	1	3	4	5

WEST TEXAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Andrews	4	5,684	0	0	2	6
Brewster	0	0	0	0	0	2
Cochran	1	629	0	0	1	3
Concho	0	0	0	0	0	3
Crane	12	15,345	0	0	3	9
Crockett	4	1,344	0	0	1	4
Crosby	0	0	0	0	0	2
Culberson	2	0	2	0	0	0
Dawson	0	0	0	0	0	1
Ector	40	48,031	1	0	14	62
El Paso	0	0	0	0	0	1
Gaines	3	3,136	0	0	0	10
Hockley	4	3,738	0	0	0	6
Howard	4	2,067	0	0	0	12
Hudspeth	0	0	0	0	0	2
Irion	0	0	0	0	0	1
Kent	0	0	0	0	0	1
Loving	1	468	0	0	0	5
Lynn	0	0	0	0	0	1
McCulloch	1	0	1	0	0	1
Nolan	0	0	0	0	0	2
Pecos	15	2,246	4	0	11	30
Presidio	0	0	0	0	1	1
Reagan	0	0	0	0	0	1
Reeves	0	0	0	0	0	2
Runnels	1	25	0	0	0	1
Schleicher	1	105	0	0	0	1
Scurry	2	318	0	0	2	5
Stonewall	0	0	0	0	0	2
Sutton	2	0	2	0	0	0
Terrell	0	0	0	0	0	3
Tom Green	1	0	1	0	0	2
Upton	18	4,870	0	0	1	6
Ward	11	5,848	0	0	4	21
Winkler	7	4,129	0	0	2	10
Yoakum	45	46,669	0	0	19	49
Ttl. Sept.	179	144,652	11	0	61	268
Ttl. Aug.	145	115,160	14	1	88	301
Difference	34	29,492	3	1	27	33

EAST TEXAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Anderson	3	71	0	2	0	7
Angelina	0	0	0	0	0	1
Camp	1	0	1	0	0	0
Ellis	1	0	1	0	0	1
Falls	2	0	2	0	0	1
Fannin	0	0	0	0	0	1
Franklin	2	617	0	0	0	1
Freestone	1	27	0	0	0	2
Grayson	2	0	2	0	0	3
Gregg	16	827	1	0	4	6
Henderson	1	0	1	0	0	0
Houston	3	150	1	0	5	4
Hunt	0	0	0	0	0	2
Leon	1	0	0	1	1	1
Limestone	2	0	2	0	1	1
Nacogdoches	0	0	0	0	0	1
Navarro	2	625	0	0	1	2
Red River	0	0	0	0	0	1
Robertson	0	0	0	0	1	0
Rusk	4	165	0	0	4	5
Smith	0	0	0	0	1	2
Titus	2	464	0	0	0	2
Trinity	0	0	0	0	1	0
Upshur	1	6	0	0	0	0
Van Zandt	1	36	0	0	0	0
Ttl. Sept.	45	2,988	11	3	20	44
Ttl. Aug.	45	1,832	20	0	10	46
Difference	0	1,156	9	3	10	2

TEXAS GULF COAST

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Ace	0	0	0	0	0	1
Allen	0	0	0	0	1	0
Anahuac	6	1,987	1	1	1	2
Bammel	1	0	0	1	1	0
Bay City	1	259	0	0	0	1
Barbers Hill	1	305	0	0	0	0
Big Creek	1	0	1	0	0	1
Boling	1	26	0	0	0	1
Caplen	1	454	0	0	0	0
Cedar Point	1	485	0	0	0	1
Clam Lake	1	0	1	0	0	0
Clear Lake	8	785	1	1	1	4
Clinton	2	0	0	2	0	1
Conroe	0	0	0	0	0	1
Cordele	4	482	1	0	1	2
Damon Md.	1	24	0	0	0	0
Dickinson	3	516	0	1	0	3
Esperson	0	0	0	0	0	3
Fannett	0	0	0	0	0	1
Fairbanks	9	1,047	1	0	0	5
Francitas	0	0	0	0	0	1
Friendswood	12	4,312	3	0	1	4
Garwood	0	0	0	0	0	1
Hardin	3	502	0	0	0	3
Hankamer	0	0	0	0	0	1
Hastings	6	3,102	0	0	1	4
Hilje	1	24	0	0	0	0
Humble	2	0	2	0	0	1
League City	2	347	0	0	0	3
Liberty	0	0	0	0	0	1
Louise	2	138	1	0	0	3
Lovells Lake	5	877	0	0	2	2
Labelle	0	0	0	0	0	1
Manvel	1	39	0	0	0	1
Martha	1	230	0	0	0	1
Markham	0	0	0	0	0	1
Magnet	1	27	0	0	2	0
Mauritz	0	0	0	0	0	1
Mykawa	1	0	1	0	0	0
Old Ocean	2	456	0	0	1	6
Orange	0	0	0	0	1	1
Pierce Jctn.	1	138	0	0	1	2
Pickett Rge.	2	141	0	0	0	1
Pt. Neches	0	0	0	0	0	1
Rosenberg	1	112	0	0	0	0
Segno	4	1,688	0	0	0	3
Silsbee	0	0	0	0	0	1
S. China	1	65	0	0	1	0
S. Cotton L.	1	105	0	0	0	2
S. Houston	1	0	1	0	1	0
Spindletop	1	13	0	0	0	1
Spurger	1	168	0	0	1	1
Thompson	5	2,790	0	0	1	3
Tombail	2	351	0	1	1	1
Turtle Bay	1	119	0	0	1	1
Van Vleck	1	178	0	0	0	1
W. Beaumont	2	489	0	0	1	0
W. Ranch	7	1,776	0	0	1	6
W. Columbia	1	10	0	0	0	3
Withers	5	508	0	2	1	4
Miscellaneous	11	0	11	0	1	8
Ttl. Sept.	128	25,435	25	9	24	102
Ttl. Aug.	96	22,657	28	1	17	87
Difference	32	2,778	3	8	7	15

COASTAL LOUISIANA

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Abbeville	1	0	1	0	0	2
Bancroft	3	764	0	0	0	3
Bateman Lake	0	0	0	0	0	2

Bay St. Elaine	0	0	0	0	0	2
Bayou Des Allemands	1	31	0	0	0	0
Black Bayou	0	0	0	0	0	1
Bayou des Glaize	0	0	0	0	1	0
Caillou Island	2	255	0	0	1	0
Cameron Meadows	0	0	0	0	0	1
Chalkley	0	0	0	0	0	2
Creole	0	0	0	0	0	1
Chacahoula	0	0	0	0	0	1
Charenton	14	1,989	1	0	2	4
Cheneyville	2	389	1	0	0	3
Choctaw	0	0	0	0	0	1
Convent	1	0	1	0	0	1
Darrow	1	552	0	0	0	1
Dog Lake	0	0	0	0	0	1
DeLarge	1	0	1	0	0	0
E. Baton Rouge	8	2,007	0	1	1	8
Edgerly	1	70	0	0	0	0
Eola	5	2,848	0	0	0	7
Fausse Pt.	0	0	0	0	1	0
Garden Island	0	0	0	0	0	1
Golden Meadows	7	1,754	1	0	2	12
Grand Bay	0	0	0	0	0	2
Grand Lake	0	0	0	0	0	2
Hackberry	4	1,084	1	0	0	3
Horseshoe Bayou	0	0	0	0	0	2
Jeanerette	0	0	0	0	0	1
Jefferson Island	1	0	1	0	0	1
Jennings	1	0	1	0	0	3
Lafitte	1	1,351	0	0	0	1
Lafourche Crossing	1	312	0	0	0	0
Lake Long	0	0	0	0	0	1
Lake Hermitage	0	0	0	0	0	1
Lake Mongoulois	0	0	0	0	0	1
La Place	0	0	0	0	0	2
Lake Pelto	0	0	0	0	0	1
Leesville	0	0	0	0	0	1
N. Crowley	1	35	0	0	0	0
N. Tepetate	1	192	0	0	0	0
New Iberia	4	336	2	0	0	5
Paradis	0	0	0	0	0	1
Perkins	0	0	0	0	0	1
Plumb Bob	1	302	0	0	0	0
Port Barre	1	0	1	0	0	2
Potash	1	202	0	0	0	1
Quarantine Bay	0	0	0	0	0	2
S. Houma	1	0	1	0	1	0
S. Roanoke	1	53	0	0	0	1
Sorrento	0	0	0	0	0	1
Sulphur	2	191	0	0	0	2
Valentine	0	0	0	0	0	3
Venice	0	0	0	0	0	1
Villa Platte	6	1,463	0	0	1	5
W. Gueydan	0	0	0	0	0	1
W. Lake Verret	0	0	0	0	0	1
White Castle	1	614	0	0	0	1
Woodlawn	1	361	0	0	0	2
Miscellaneous	4	0	4	0	5	21
Ttl. Sept.	80	17,155	17	1	15	127
Ttl. Aug.	75	17,698	23	0	30	116
Difference	5	543	6	1	15	11

ROCKY MOUNTAIN AREA

New Mexico

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bernalillo	0	0	0	0	0	2
McKinley	0	0	0	0	0	2
San Juan	2	23	0	0	0	10
San Miguel	0	0	0	0	0	3
Socorro	0	0	0	0	0	1
Torrance	1	0	0	1	0	1
Valencia	0	0	0	0	0	2
Chaves	0	0	0	0	2	8
Dona Ana	0	0	0	0	0	2
Eddy	15	4,340	4	0	7	59
Lea	25	13,371	0	1	8	51
Luna	0	0	0	0	0	1
Otero	0	0	0	0	0	2
Ttl. Sept.	43	17,734	4	2	17	144
Ttl. Aug.	40	16,667	2	1	17	122
Difference	3	1,067	2	1	0	22

Utah

Month—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Total Sept.	0	0	0	0	1	4
Total Aug.	0	0	0	0	1	4
Difference	0	0	0	0	0	0

Wyoming

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Big Horn	2	2	1	0	0	4
Carbon	2	10,807	0	0	0	4
Converse	0	0	0	0	0	8
Fremont	2	0	2	0	0	4
Hot Springs	0	0	0	0	0	2
Natrona	0	0	0	0	0	3
Niobrara	2	2,356	0	0	1	14
Park	1	0	0	1	0	2
Sublette	4	172	0	0	1	6
Sweetwater	1	120	0	0	0	5
Uinta	0	0	0	0	0	5
Weston	5	2	4	0	1	10
Miscellaneous	0	0	0	0	0	6
Ttl. Sept.	19	13,459	7	1	3	73
Ttl. Aug.	20	16,506	5	2	4	73
Difference	1	3,047	2	1	1	0

Colorado

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	0	0	0	0	0	2
Archuleta	0	0	0	0	0	3
Boulder	0	0	0	0	0	3
Fremont	0	0	0	0	0	2
Huerfano	1	5	0	0	0	8
La Plata	0	0	0	0	0	1
Las Animas	0	0	0	0	0	2
Moffat	1	125	0	0	0	3
Park	0	0	0	0	0	1
Pueblo	0	0	0	0	1	2
Rio Blanco	0	0	0	0	0	5
Routt	0	0	0	0	0	2
Miscellaneous	0	0	0	0	1	6
Ttl. Sept.	2	130	0	0	2	40
Ttl. Aug.	2	0	2	0	2	30
Difference	0	130	2	0	0	1

Montana

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Big Horn	0	0	0	0	0	2
Carbon	0	0	0	0	0	5
Fergus	0	0	0	0	0	2
Glacier	4	204	0	1	0	9
Liberty	0	0	0	0	0	1
Petroleum	0	0	0	0	0	2
Pondera	1	27	0	0	0	1
Teton	0	0	0	0	0	1
Toole	5	50	2	0	0	14
Ttl. Sept.	10	281	2	1	0	46
Ttl. Aug.	24	781	5	4	0	46
Difference	14	500	3	3	0	0

NEBRASKA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Cass	0	0	0	0	0	1
Dakota	0	0	0	0	0	1
Dawes	0	0	0	0	1	0
Keith	0	0	0	0	0	1
Richardson	0	0	0	0	1	1
Scotts Bluff	0	0	0	0	0	2
Ttl. Sept.	0	0	0	0	2	8

IOWA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Fremont	0	0	0	0	0	1
Guthrie	0	0	0	0	0	1
Ttl. Sept.	0	0	0	0	0	2

ILLINOIS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	1	0	1	0	0	0
Bond	1	0	1	0	0	4
Brown	0	0	0	0	0	3
Champaign	2	0	2	0	0	0
Christian	0	0	0	0	1	0
Clark	2	0	2	0	0	7
Clay	14	4,882	1	0	1	13
Clinton	1	0	1	0	2	5
Coles	1	0	1	0	0	3
Crawford	1	60	0	0	0	0
Douglas	1	0	1	0	0	0
Edgar	1	0	1	0	0	1
Edwards	3	321	1	0	3	9
Effingham	0	0	0	0	1	4
Fayette	67	12,180	7	0	13	66
Ford	0	0	0	0	0	1
Franklin	0	0	0	0	0	2
Gallatin	2	200	1	0	0	0
Greene	0	0	0	0	1	1
Hamilton	0	0	0	0	0	2
Henderson	0	0	0	0	0	1
Jackson	0	0	0	0	0	1
Jasper	2	10	1	0	0	0
Jefferson	3	200	1	0	3	4
Jersey	0	0	0	0	0	2
Johnson	0	0	0	0	0	2
Knox	1	0	1	0	0	0
Lawrence	7	78	3	2	0	5
Livingston	1	0	1	0	0	1
Madison	1	0	1	0	0	1
Marion	105	40,189	6	0	8	82
Massac	0	0	0	0	0	2
McDonough	2	0	2	0	0	1
Menard	0	0	0	0	0	1
Monroe	1	0	1	0	1	3
Montgomery	0	0	0	0	0	4
Perry	1	0	1	0	0	0
Pike	0	0	0	0	0	2
Pope	0	0	0	0	0	1
Randolph	0	0	0	0	0	3
Richland	4	1,487	1	0	5	4
Schuyler	1	0	1	0	0	0
Shelby	1	0	1	0	1	2
St. Clair	1	0	1	0	1	8
Tazewell	0	0	0	0	0	1
Wabash	50	8,711	7	0	16	67
Washington	9	789	1	0	2	10
Wayne	24	5,603	5	0	8	27
White	4	396	0	0	10	20
Williamson	0	0	0	0	1	1
Ttl. Sept.	314	75,046	54	2	78	377
Ttl. Aug.	259	70,308	47	0	66	400
Difference	55	4,738	7	2	12	23

INDIANA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	1	2	0	0	0	0
Blackford	0	0	0	0	0	1
Clay	0	0	0	0	0	1
Daviess	2	0	2	0	1	2
Delaware	1	0	1	0	0	0
Gibson	16	2,693	2	1	3	22
Grant	0	0	0	0	0	1
Hancock	0	0	0	0	1	0
Henry	0	0	0	0	0	1
Huntington	1	0	1	0	0	2
Jay	0	0	0	0	0	1
Jasper	1	10	0	0	0	0
Knox	2	15	1	0	1	3
Lagrange	0	0	0	0	0	1
La Porte	0	0	0	0	0	0
Madison	0	0	0	0	0	1
Marion	1	0	1	0	0	1
Owen	0	0	0	0	0	1
Perry	1	0	1	0	0	1
Pike	0	0	0	0	0	3
Posey	9	3,870	4	0	3	7
Spencer	2	0	1	1	1	8
St. Joseph	0	0	0	0	0	1
Sullivan	1	0	1	0	0	3
Tipton	1	0	1	0	0	0
Vanderburg	3	43	0	0	1	2
Warrick	1	0	1	0	0	2
Whitley	0	0	0	0	0	1
Ttl. Sept.	43	6,433	17	2	11	66
Ttl. Aug.	58	5,589	24	4	19	54
Difference	15	844	7	2	8	12

WESTERN KENTUCKY

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Breckinridge	4	5	3	0	0	4
Butler	1	10	0	0	0	1
Caldwell	0	0	0	0	0	1
Christian	0	0	0	0	0	2
Daviess	11	470	5	0	0	25
Hancock	2	0	2	0	0	9
Henderson	2	0	2	0	0	2
Hopkins	0	0	0	0	0	2
Livingston	0	0	0	0	0	2
Logan	0	0	0	0	0	2
McLean	2	295	0	0	0	4
Ohio	10	41	5	0	0	9
Todd	1	0	0	1	0	1
Webster	0	0	0	0	0	3
Ttl. Sept.	33	821	17	1	0	67
Ttl. Aug.	44	960	24	1	0	62
Difference	11	139	7	0	0	5

EASTERN KENTUCKY

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Martin	8	14	0	6	2	7
Knott	2	0	0	2	2	3
Magoffin	2	0	2	0	1	3
Lee	1	0	1	0	1	4
Powell	5	65	0	0	1	5
Floyd	5	0	0	5	2	8
Pike	4	0	0	4	1	6
Wolfe	1	0	1	0	1	1
Knox	1	0	1	0	0	1
Ttl. Sept.	29	79	5	17	11	38
Ttl. Aug.	20	49	3	14	7	42
Difference	9	30	2	3	4	4

OHIO

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Ashland	1	0	0	1	0	1
Athens	7	15	2	4	1	12
Columbiana	0	0	0	0	0	1
Coshocton	3	104	0	1	1	2
Cuyahoga	3	0	1	2	2	2
Fairfield	1	0	0	1	0	2
Franklin	0	0	0	0	0	1
Gallia	0	0	0	0	1	0
Guernsey	2	0	1	1	0	8
Geauga	0	0	0	0	0	1
Hocking	2	0	0	2	1	4
Holmes	1	0	0	1	0	5
Jackson	1	0	0	1	0	0
Knox	6	40	4	1	3	9
Lawrence	2	0	0	2	0	2
Licking	16	50	5	10	3	22
Lorain	3	0	0	3	1	2
Medina	8	101	4	1	1	5
Meigs	3	0	0	3	0	4
Monroe	2	0	0	2	1	7
Morgan	2	0	1	1	0	3
Muskingum	2	12	1	0	0	10
Noble	8	0	3	5	2	7
Perry	4	0	3	1	0	3
Richland	1	0	1	0	1	1
Stark	0	0	0	0	1	6
Summit	1	0	1	0	0	1
Tuscarawas	3	0	2	1	0	3
Washington	2	0	2	0	4	13
Wayne	0	0	0	0	1	1
Ttl. Sept.	84	412	31	44	24	138
Ttl. Aug.	105	441	33	50	27	121
Difference	21	29	2	6	2	17

LIMA FIELD

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Auglaize	0	0	0	0	0	1
Allen	0	0	0	0	1	0
Henry	1	5	0	0	0	2
Putnam	0	0	0	0	0	1
Seneca	0	0	0	0	0	1
Wood	0	0	0	0	0	1
Wyandott	1	30	0	0	0	0
Ttl. Sept.	2	35	0	0	1	6
Ttl. Aug.	2	0	1	1	2	7
Difference	0	35	1	1	1	1

MICHIGAN

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	1	163	0	0	0	1
Bangor	4	25	3	0	1	4
Broomfield	1	418	0	0	0	1
Clayton	1	0	1	0	0	2
Columbia	1	0	1	0	1	1
Deerfield	1	70	0	0	0	4
Freeman-Redding	11	7,094	1	2	4	12
Grand Rapids	40	21,199	1	0	8	41
Hopkinsburg	2	0	2	0	0	0
Loomis	1	282	0	0	0	3
Monterey	2	0	0	2	0	2
Mt. Pleasant	0	0	0	0	0	2
New Salem	7	3,519	0	0	2	6
New Haven	1	0	1	0	0	1
Porter	0	0	0	0	0	2
S.E. Columbia	2	200	1	0	3	4
Salem	4	850	0	0	0	6
Sherman	1	350	0	0	0	1
Stewart	0	0	0	0	0	1
W. Branch	0	0	0	0	0	2
Wisner	0	0	0	0	0	4
Winegard	0	0	0	0	0	1
Esmore	1	0	1	0	0	1
Miscellaneous	46	270	42	1	5	58
Ttl. Sept.	127	34,440	54	5	24	160
Ttl. Aug.	116	34,496	39	5	25	160
Difference	11	56	15	0	1	0

EASTERN FIELDS

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Allegany	66	80	0	0	11	47
Bradford	201	296	0	0	19	101
Middle dist.	9	10	1	1	2	17
Butler-Armstrong	9	17	4	0	5	11
North Oriskany	8	0	4	4	4	22
S.W. Pa.	25	11	5	16	9	49
S.E. Ohio	52	338	13	18	12	57
West Va.	72	279	8	48	23	134
Ttl. Sept.	442	1,031	35	87	85	438
Ttl. Aug.	396	1,089	34	68	66	342
Difference	46	58	1	19	19	96

NORTH LOUISIANA

Parish—	Comp.	Prod.	Dry	Gas*	Rgr.	Dlg.
Bienville	2	0	0	2	0	0
Bossier	5	65	2	1	0	1
Caddo—Rodessa	1	375	0	0	0	2
Caddo—other	15	525	5	0	5	12
Caldwell	0	0	0	0	0	1
Catahoula	0	0	0	0	1	0
Claiborne	0	0	0	0	0	2
De Soto	0	0	0	0	3	2
Franklin	1	0	1	0	1	0
Grant	1	0	1	0	0	1
La Salle	1	15	0	0	4	0
Morehouse	2	0	0	2	1	2
Natchitoches	0	0	0	0	1	1
Red River	1	0	1	0	0	0
Sabine	3	0	3	0	2	8
Tensas	0	0	0	0	1	0
Union	5	0	0	5	0	3
Webster	5	2,230	0	1	2	7
Ttl. Sept.	42	3,210	13	11	21	42
Ttl. Aug.	56	8,665	14	13	24	47
Difference	14	5,455	1	2	3	5

*Gas production: Bienville Parish, 57,950,000 cu. ft.; Bossier Parish, 5,000,000 cu. ft.; Morehouse Parish, 3,331,000 cu. ft.; Union Parish, 7,145,000 cu. ft.; Webster Parish, 10,000,000 cu. ft.

ARKANSAS

County—	Comp.	Prod.	Dry	Gas*	Rgs.	Dlg.
Clark	0	0	0	0	1	1
Clay	0	0	0	0	1	0
Columbia	11	5,315	0	0	3	9
Craighead	0	0	0	0	1	0
Faulkner	0	0	0	0	0	1
Hot Springs	0	0	0	0	1	0
Howard	0	0	0	0	1	1
Independence	0	0	0	0	0	1
Lafayette	2	830	0	0	1	3
Little River	1	0	1	0	0	1
Lonoke	0	0	0	0	2	1
Miller—Rodessa	0	0	0	0	1	0
Nevada	2	125	1	0	1	0
Ouachita	0	0	0	0	1	2
Pike	1	0	1	0	0	0
Pulaski	0	0	0	0	1	0
Saline	0	0	0	0	1	0
Sevier	0	0	0	0	0	1
Union	4	965	1	1	5	6
White	0	0	0	0	1	0
Ttl. Sept.	21	7,235	4	1	22	27
Ttl. Aug.	31	10,695	5	1	18	32
Difference	10	3,460	1	0	4	5

*Gas production: Union County, 4,300,000 cu. ft.

EAST TEXAS BORDER

County—	Comp.	Prod.	Drv	Gas*	Rgs.	Dlg.
Cass	0	0	0	0	0	1
Harrison	1	0	0	1	1	0
Marion—Rodessa	3	840	0	1	2	1
Marion—other	3	10	2	0	3	3
Panola	0	0	0	0	0	1
Shelby	0	0	0	0	1	1
Ttl. Sept.	7	850	2	2	7	7
Ttl. Aug.	5	795	1	0	10	4
Difference	2	55	1	2	3	3

*Gas production: Harrison County, 24,560,000 cu. ft.; Marion—Rodessa, 61,000,000 cu. ft.

MISSISSIPPI

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Claiborne	0	0	0	0	1	0
Copiah	0	0	0	0	1	0
Harrison	0	0	0	0	1	1
Hinds	0	0	0	0	1	1
Itawamba	0	0	0	0	1	0
Kemper	0	0	0	0	1	0
Lafayette	0	0	0	0	0	1
Pike	0	0	0	0	1	0
Prentiss	0	0	0	0	0	1
Simpson	0	0	0	0	1	0
Washington	0	0	0	0	1	0
Yazoo	1	185	0	0	1	2
Ttl. Sept.	1	185	0	0	10	5
Ttl. Aug.	4	0	4	0	3	3
Difference	3	185	4	0	7	2

Market Record of Active Oil Stocks

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1939 High	1939 Low	Week ending Oct. 21 High	Week ending Oct. 21 Low	Week ending Oct. 21 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1938	Com. sh. earn. 1938	Com. sh. earn. 1937	1938 High	1938 Low	1937 High	1937 Low
74½	50	68¼	67	67¾	Amerada Corp.	788,675	N.P.	50cQ	10-31-39	$2.00	$2.07	$3.04	78	55	111⅞	51½
24⅞	18⅛	24⅞	24	24¼	Atlantic Refining	2,663,999	$25	25cQ	9-15-39	1.00	1.40	3.51	27⅝	17¾	37	18
21½	10¼	17⅜	16	17	Barber Asphalt Co.	390,223	$10	75c	12-16-37	....	—.85	1.91	23¾	12½	43⅜	10¾
19½	11⅛	17⅛	14¾	14⅞	Barnsdall Oil Co.	2,250,344	$5	15c	12-9-39	1.00	1.26	.85	21⅝	10⅛	35¼	10
9⅞	6½	9	8⅝	8⅝	Consolidated Oil Corp.	13,751,846	N.P.	20cQ	11-15-39	.80	.55	1.48	10¾	7	17⅞	7
31½	19⅞	29¼	27¾	28¾	Continental Oil of Delaware	4,682,581	$5	25cQ	9-28-39	‖1.00	1.10	2.98	35¾	21¼	49	24
9⅜	4½	8¼	7½	8	Houston Oil (new)	1,098,618	$25	....	10-17-30	....	.83	.94	9¾	5	17⅝	4¾
20¼	10	16	15⅛	15⅛	Lion Oil Refining	435,815	N.P.	25cQ	10-10-39	1.00	2.09	2.17	25½	15⅝	34	12½
18	11⅛	16¾	16¼	16½	Mid-Continent Petroleum	1,857,912	$10	35c	12-1-39	.60	.56	2.86	22⅝	12¼	35⅜	14
14⅞	8¾	12	11½	11⅞	Mission Corporation	1,379,245	$10	25c	6-29-39	1.00	1.04	1.31	17¾	10⅝	34	15
15½	5⅝	12⅜	11½	11⅞	National Supply	1,155,517	$10	$2 pf.‡	12-22-37	....	—.79	4.90	23	12½	41⅜	17⅝
10½	6	9	8¼	8⅝	Ohio Oil Co.	6,563,377	N.P.	20c	12-15-38	.20	.25	1.30	14⅞	8⅞	22⅞	8
11⅞	7⅜	10	9½	9½	Pacific Western Oil	1,000,000	N.P.	50c	12-20-38	.50	1.22	1.39	15⅞	10¼	29¾	11¾
8¾	5	7	6½	7	Pan American Pet. & Trans.	4,702,945	$5	$1*	12-21-37	....	.08	1.18	9¼	6¼	17⅛	7
46½	31¼	46¼	44¼	45¾	Phillips Petroleum	4,449,052	N.P.	50cQ	9-1-39	‖2.00	2.03	5.42	44⅝	27¼	64	30½
24	17⅛	23	22	22	Plymouth Oil Co.	1,006,200	$5	35cQ	9-30-39	1.40	2.59	2.85	25⅜	15	29⅞	13
11⅜	6⅛	10¼	9⅝	9⅝	Pure Oil Co.	3,982,031	N.P.	25c	12-1-37	....	.38	2.15	13½	8¼	24⅜	8¾
10¼	6⅝	8⅝	8¼	8¼	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-38	.50	.51	.35	9⅞	5	6½	4½
24⅜	15½	23	22	22¼	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	9-15-39	1.00	1.52	1.97	27½	15½	54⅛	16
17¼	9⅞	14⅝	14	14⅜	Shell Union Oil	13,070,625	N.P.	25c	7-20-39	.70	.72	1.44	18⅜	10	34⅜	14⅞
29½	15½	24½	23	23	Skelly Oil	995,349	$15	50c	11-15-39	1.00	2.27	6.07	34¾	18½	60⅝	26½
15⅛	10¼	14⅛	13¾	14	Socony-Vacuum	31,206,071	$15	25cSA	9-15-39	.50	1.29	1.82	16⅜	10⅜	23¼	13
33⅝	24¼	30	28⅝	28¾	Standard Oil of California	13,004,153	N.P.	25cQ	9-15-39	1.40	2.22	3.17	34⅞	25⅛	50	27⅛
30	22¾	28⅜	27¼	27½	Standard Oil (Indiana)	15,272,020	$25	25cQ	9-15-39	1.00	1.82	3.66	35½	24¾	50	26½
53½	38	49½	47⅝	48½	Standard Oil of New Jersey	26,618,065	$25	50c‖	6-15-39	‖1.50	2.86	5.64	58⅜	39¾	76	42
66	45¾	61¼	60¼	60¼	Sun Oil	2,316,484	N.P.	25cQ	12-15-39	1.00	1.07	3.86	65½	45	77½	44½
3⅝	1¾	3	2⅞	2⅞	Superior Oil Corp.	1,388,979	$1	10c	12-28-38	.10	.24	.32	4¼	1⅜	7¾	1½
50¾	32½	48½	46	47½	Texas Corp.	10,876,882	$25	50cQ	10-2-39	2.00	2.13	5.02	49⅝	32⅝	65½	34¾
5⅜	3¼	5	4⅝	4¾	Texas Gulf Producing Co.	888,144	N.P.	10c	6-15-39	.15	.86	.68	5⅞	2⅝	9⅝	2
11⅜	7	10⅛	9⅜	9¾	Texas Pacific Coal & Oil	888,236	$10	10c	9-1-39	.40	1.16	1.11	12½	7	16⅝	5⅝
14¼	9½	13⅛	12¼	12⅝	Tide Water Associated	6,375,253	$10	15c	9-1-39	1.00	1.28	2.08	15⅜	10⅛	21⅝	13⅛
19¾	15⅛	17⅞	17½	17¾	Union Oil of California	4,666,270	$25	25c	8-10-39	1.20	1.47	2.58	22½	17⅛	28⅛	17½
24¼	20½	23⅝	23¼	23⅝	Union Tank Car Co.	1,177,381	N.P.	30cQ	9-1-39	1.30	1.16	1.70	23½	20	31½	22
3⅞	2⅝	3¼	3¼	3¼	Wilcox Oil & Gas	487,568	$5	....	5-10-28	....	.52	.24	3½	1⅝	6¼	1⅝

*Payable in 3½ per cent notes. †Includes extras. ‡One-tenth share $2 preferred stock. §Also 1½ per cent stock dividend. ‖Also right to subscribe to bonds. ¶Also 1 per cent in stock. —Deficit.

New York Curb Exchange

1939 High	1939 Low	Week ending Oct. 21 High	Week ending Oct. 21 Low	Week ending Oct. 21 Close	Stocks—	Total shares Outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1938	Com. sh. earn. 1938	Com. sh. earn. 1937	1938 High	1938 Low	1937 High	1937 Low
11¾	5½	8⅝	8	8	American Republics Corp.	1,308,049	$10	10c	7-11-38	$0.10	—$0.22	$0.27	11¾	5	10	6⅝
7¼	2½	4⅛	4	4⅛	Bridgeport Machine Co.	270,000	N.P.	$1.25	12-30-37	....	—.14	1.90	10¼	4⅞	21⅜	7
34¾	26½	29⅝	28⅝	29⅜	Buckeye Pipe Line Co.	200,000	$50	50c	9-15-39	2.00	2.36	4.02	39	22½	51½	36
130	110	115	115	115	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	9-25-39	6.50	5.32	6.73	128	97	112	95½
9¼	4½	6⅛	5⅞	5⅞	Cities Service (new)	3,704,067	$10	....	6-1-32	....	.23	1.02	11	5½	5⅝	1½
2¼	½	2	1⅝	1⅝	Cosden Petroleum	462,551	$1	....	....	....	....	.19	2⅜	⅞	5½	1½
28	16¾	27	26	26½	Creole Petroleum	6,975,383	$5	50cSA†	6-15-39	1.00	1.64	1.61	27½	17½	38¾	20¼
7⅛	3⅝	5⅛	5	5⅛	Darby Petroleum	351,390	$5	25cSA	1-15-39	.50	....	1.36	10¼	5½	18⅝	6½
2⅝	1½	2⅜	2¼	2⅜	Derby Oil & Refining	263,162	N.P.	....	....	....	—.91	1.34	3½	1½	8⅜	2¼
20½	15⅛	20½	19¾	20½	Eureka Pipe Line	50,000	$50	50c	11-1-39	3.00	—.37	—.12	31	16	47½	24½
45⅛	29¼	45⅛	43	44½	Gulf Oil Corp.	9,076,202	$25	25cQ	10-1-39	1.00	1.43	3.51	46⅞	33	63½	33
71	52½	69¼	68	69	Humble Oil & Refining	8,987,840	N.P.	62½c	10-2-39	3.00	3.98	5.22	72⅝	56	87	54⅞
17	11⅝	14	13⅛	13⅞	Imperial Oil of Canada	26,965,078	N.P.	62½cSA†‡	6-1-39	1.25	.96	.98	19½	14⅛	24¼	14½
7	5⅝	7¼	6¾	7¼	Indiana Pipe Line	300,000	$10	30c	5-15-39	.50	.47	1.03	9⅜	6	15	5⅝
27½	17½	21¾	20	21¾	International Petroleum	14,324,088	N.P.	1.00†‡	6-1-39	2.50	1.98	....	31¼	21	39½	23½
3¾	2⅛	2¾	2¼	2¼	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	.10	.14	.17	5	2⅛	8¾	2⅝
9½	7⅛	8⅝	8½	8½	Lone Star Gas	5,553,747	N.P.	20c	8-21-39	.60	.88	1.14	10⅜	6⅝	14¼	5¼
7¾	4	6	5⅝	5⅞	Louisiana Land & Exp.	2,977,449	$1	10cQ	9-15-39	.45	.45	.58	9⅜	6½	15¼	6⅝
17	14½	..	..	..	Margay Oil Corp.	149,943	N.P.	25cQ	10-10-39	1.00	2.28	3.26	24	16	33½	17
8¾	6⅝	8	7⅝	7⅝	Midwest Oil Co.	998,474	$10	45c	6-15-39	1.00	.93	1.14	9¾	6⅝	14⅝	6½
5⅞	4⅞	5⅞	5⅝	5⅝	Mountain Producers	1,593,584	$10	30cSA	6-15-39	.60	.62	.76	5⅜	4½	7⅜	4½
14	11¼	13⅜	13¼	13¼	National Fuel Gas	3,810,183	N.P.	25cQ	10-16-39	1.00	.84	.96	14⅝	11½	19½	12
8⅝	7¼	8⅜	8⅜	8¾	National Transit	509,000	$12.50	35c	6-15-39	.75	.88	1.19	9¼	6½	12½	7¼
1⅝	1½	1½	1½	1½	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	2⅝	1½	5	1⅛
4⅞	4	4½	4½	4½	New York Transit	100,000	$5	25c	10-14-39	.25	.16	.49	4½	3½	5⅜	3⅞
6	4¼	5½	5¼	5¼	Northern Pipe Line	120,000	$10	15c	12-1-39	.35	.24	.78	6	4	12⅜	5⅜
7⅜	4	5⅝	5½	5¼	Pantepec Oil	2,857,000	$1	....	....	....	....	....	7¾	3½	9⅝	2¾
4½	1¼	4½	3⅝	4⅛	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.17	—.17	4½	1⅝	12¾	2
3	1⅞	2⅝	2⅜	2⅜	Ryan Consolidated	298,931	N.P.	....	....	....	.29	.46	4	2⅛	6½	2¼
4⅞	3½	4⅞	2⅜	2⅜	Southern Pipe Line	100,000	$10	15cSA	9-1-39	.30	—.27	.85	5⅜	3¼	7¼	3⅞
39½	26⅜	37½	36½	37¼	South Penn Oil	1,000,000	$25	37½cQ	9-29-39	1.75	1.44	4.64	39	28¾	56	35
19¾	18	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50cQ	10-2-39	2.00	—.41	.95	22¼	16½	42	20
18⅞	17¼	18¾	18⅛	18¾	Standard Oil of Kentucky	2,604,790	$10	25c	9-15-39	1.25	1.45	1.60	18¾	15	21⅛	14¾
26⅜	17	26⅛	25½	25½	Standard Oil of Ohio	753,740	$25	25c	9-15-39	1.00	1.81	3.67	22¾	16¼	45	16
2⅜	1⅜	2¼	2	2¼	Sunray Oil	2,007,076	$1	5c	4-27-39	.05	.23	.42	3¼	2	4⅞	2
4	2⅝	3	3	3	Texon Oil & Land	936,024	$2	10c	6-30-39	.60	.56	.51	5¼	3½	7⅝	2
6	2½	3¾	3½	3⅝	Transwestern Oil Co.	750,000	$10	....	....	....	—.12	.48	7⅝	4¼	13⅞	4⅝
3⅜	1⅝	2⅜	2½	2⅜	United Gas Corp.	7,818,959	$1	....	....	....	—.51	.25	5¼	2⅝	13⅞	3

†Includes extras. ‡Payable in Canadian funds. —Deficit.

Personal Paragraphs

BERT FIELDS, independent operator and drilling contractor of Dallas, Tex., is preparing to move to his ranch home on the Preston Road, near Dallas.

JAMES W. GALLAGHER, material supervisor for Carter Oil Co. in St. Elmo, Ill., sailed October 14 on the American export liner Excalibur for Cairo, Egypt, where he will hold a similar position with Standard Oil Co. of Egypt.

W. S. McCABE, geologist with the Superior Oil Co., Midland, Tex., and MISS WILMA BROWN, of Chicago, were married in the latter city Tuesday, October 10. Mr. and Mrs. McCabe are back at home in Midland after a honeymoon trip through the Ozark Mountains.

BYRON RIFE, president of Southern Cross Oil Co. and Barbara Oil Co., San Antonio, Tex., and E. H. BADGER and A. J. WEYEL, JR., have organized Rife Petroleum Co.

HANS WALCHLI, of Clarendon, Pa., veteran Pennsylvania refiner, has been appointed general manager of Allegany Refiners, Inc., Bolivar, N. Y., to succeed HARVEY L. CHAMBERS, resigned.

RICHARD W. ASHLEY, geological scout with the Arkansas Fuel Oil Co., Shreveport, La., has been transferred from Shreveport to Jackson, Miss., to watch new developments in that state.

F. J. WOLFE, chairman of Anglo-American Oil Co., Ltd., London, expects to leave England about the first of November and spend several months in the United States. Among other visits he plans an extended stay on the Pacific Coast.

A. C. BURWELL has been named vice president in charge of engineering; J. G. MONTGOMERY, JR., vice president in charge of production and geology; D. E. CONAWAY, chief geologist; and G. F. GEARHART, chief engineer, by the directors of the United Natural Gas Co., Oil City, Pa.

JOHN W. GLAHN, land man for I. T. I. O. Co., formerly of Abilene, Tex., and Illinois, has started operating out of Fort Worth, Tex., as district land man for the company. LEWIS CORYELL, district geologist, was transferred to Midland, Tex., following the closing of the Abilene offices.

JOHN HUFFMAN, engineer for the Louisiana Conservation Department, accompanied by Mrs. Huffman, is in New Orleans on a vacation trip.

DR. JOHN C. HAFF, petrologist, has been engaged by the Colorado School of Mines as an assistant professor of geology for the ensuing year. Dr. Haff received his Ph.D. from Columbia University. In 1936 he was awarded a traveling fellowship by that institution and during the following year studied petrologic methods and their application at Innsbruck, Austria, and Zurich, Switzerland. In 1938-39 he was on the staff of Wichita University, and just before assumption of his duties at the Colorado School of Mines he was in the petrographic laboratory of the Bureau of Reclamation in Denver, Colo.

BLAIR McCARTER, consulting geologist and appraiser specializing in salt domes, has moved to 2522 Hagart Street, Houston, Tex., from Lafayette, La.

SAMUEL OLIPHANT, young University of Texas graduate engineer from Longview, has been awarded a research fellowship at that institution by Stanolind Oil & Gas Co. It will be his job to devise muds satisfactory for lubricating drilling through the shifting Gulf Coast shales and for withstanding the terrific pressures of 2 and 3-mile-shaft depths, and to slash mud costs, which in that area mount to $100,000 for a single well in some cases. Mr. Oliphant replaces THOMAS W. KEATING, who now is employed as Gulf Coast district mud engineer for the company.

JOSEPH H. LEE has been appointed manager of the lubricating department of the Shell Oil Co., Inc., on the eastern seaboard. He formerly was assistant manager, and he replaces CLARENCE V. BEATON, who has joined Asiatic Petroleum Corp. Mr. Lee entered Shell service on the West Coast as a salesman 15 years ago and advanced steadily, soon becoming manager of the lubricating department in Honolulu, then manager of the Oakland, Calif., area and in 1937 becoming assistant manager of the lubricating department for the eastern company, which position he held until his latest advancement. He attended the University of California.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Cosden Refining Co. has doubled its capital stock, making it $2,000,000.

Dr. David T. Day has resigned from the U. S. Geological Survey to enter private practice.

Gypsy Oil Co. led all Oklahoma companies in production in that state in the first half of 1914 with 3,904,828 bbl. Prairie Oil & Gas Co. was second with 3,523,156 bbl., and Barnsdall Oil Co. third with 1,704,807 bbl.

Mexican Petroleum Co.'s No. 7 Casiano, in the Tampico, Mexico, district, is 4 years old and has produced 33,580,000 bbl. of crude.

20 YEARS AGO

Van H. Manning says 40 per cent of the original available oil supply in this country has been brought to the surface, and that future needs should be taken seriously.

Claim jumping is rampant in the Osage, Wyoming, oil field and operators have armed themselves with six-shooters. A recent gun battle between representatives of two companies fortunately ended with no casualties.

St. Louis has clapped a half-cent-per-gallon tax on retail gasoline sales which has sent the price to consumers, up a half cent, to 23 cents per gallon.

Humble Oil & Refining Co. increases its capital stock from $8,000,000 to $25,000,000. The company has over 30,000 bbl. daily production.

10 YEARS AGO

Hugh King, 87, pioneer oil operator and former president of the Columbia Oil Co., dies in Chatham, N. Y. He was one of the founders of the Pure Oil Co. and a member of its directorate, and founded the Cortez Oil Co. which operates in the Mid-Continent. He sold his Columbia Oil Co. interests to the Royal Dutch-Shell.

W. C. COLBY, personnel and industrial-relations manager of Lago Petroleum & Transport Co., left New York October 20 for Aruba, N.W.I.

JAMES ANDERSON, Houston, Tex., vice president of Humble Oil & Refining Co., returned last week from an extended trip to New York.

HARRISON LAWLER has been appointed director of public relations of Richfield Oil Corp., succeeding HOWARD CAGLE, and he will have his office at the headquarters of the company in Los Angeles, Calif.

DR. G. S. HUME, of the Geological Survey of Canada, who spent the early part of the season on the Jumping Pound and Pekisko areas, is carrying on geological work for the federal government in the Wainwright field and other east central Alberta areas.

M. B. DOLAN, manager of the Yazoo City, Miss., district office of Southern Natural Gas Co., will superintend construction of a gas pipe line from the company's system to the newly discovered Tinsley dome field to serve drilling fuel for the field's development.

CAPT. BUSHROD B. HOWARD, U.S.N. retired, has been elected vice president and a director of Standard Oil Co. of New Jersey and made general manager of the marine department. Captain Howard succeeds ROBERT F. HAND, who retired last week from the same offices. Mr. Hand succeeded Robert L. Hague, who died a few months ago.

CLINT CROSBY, rotary drilling contractor of Centralia, Ill., has been made general manager of Algoma Oil Co., Inc.

HAROLD D. HUMPSTONE, president of West India Oil Co. in Chile, left New York last week for his South American post.

S. GRINSFELDER has been appointed general manager of Union Oil Co. of California district offices recently opened in Houston, Tex.

SAM RUSSELL CASEY, JR., geologist for Woodley Petroleum Co. in Houston, Tex., and MISS MARJORIE LOU VEDDER, of Houston, were married October 14.

EARL SWEETZER, Beverly Hills, Calif., production superintendent of Thomas Kelly & Sons, Inc., California independent producer, is recuperating from an abdominal operation.

G. W. LAURIE, lubricating engineer for Atlantic Refining Co., will speak October 27 before the Society of Automotive Engineers meeting in St. Louis, Mo., on "Factors in Large-Engine Wear."

HAROLD F. SHEETS, vice president of Socony-Vacuum Oil Co., Inc., addressed 430 employes of the company who are members of the Twenty-Year Service Club at a banquet in New York last week. W. B. MILLER is president of the club.

F. B. PRESTON, formerly manager of La Brea refinery of Trinidad Oil Fields Operating Co., Ltd., has been transferred to Aruba, N.W.I. Mr. Preston sailed from New York October 20 with Mrs. Preston for his new station, where Lago Oil & Transport Co., Ltd., operates one of the world's largest refineries. Both Lago and Trinidad are subsidiaries of Standard Oil Co. of New Jersey.

Got to Going Right at 18

When Frank Buttram, new president of the Independent Petroleum Association of America, had explored the mysteries of education as far as the eighth grade he left school.

FRANK BUTTRAM

He was a farm boy, born in Chickasaw Nation, Indian Territory, in 1886. He felt dissatisfied. So at 18 he determined to penetrate the upper strata of learning, and with that decision he really got to going right. He enrolled for the spring term at Central State Normal School, Edmond, and for the summer term at the Teachers Institute, Tecumseh, both in what is now Oklahoma. He got a teacher's certificate and he taught a year before going back to Edmond, where he graduated. Then he settled down to teaching? He did not. He matriculated at the University of Oklahoma, where he worked like a demon, winning a B.S. in 1 year and a summer and followed that up with a master's degree.

Entering the Oklahoma State Geological Survey, young Buttram produced bulletins that attracted wide attention. Then, with two others, he organized Fortuna Oil Co. Selling his interest in 1920, he launched Buttram Petroleum Corp., of which he is president and owner.

Mr. Buttram, named Oklahoma City's most useful citizen in 1936, is a director and vice president of the First National Bank & Trust Co., Oklahoma City, and he was the leader in establishing the city manager form of government there. He married Merle Newby, and they have five children.

GEORGE W. STORMS, Allegany field producer and drilling contractor, and Mrs. Storms recently celebrated their golden wedding anniversary at their home in Allentown, N. Y.

W. B. TRAMMELL, Houston, Tex., independent operator and former president and general manager of Houston Natural Gas Co., has been appointed city tax assessor and collector.

R. J. BRENNAN, Forest Oil Co. executive, and LYNN G. SMITH, former president of the Bradford District Oil Producers Association, have been named chairman and vice chairman, respectively, of the annual Bradford, Pa., community chest drive.

B. W. BEEBE, Wichita, Kans., geologist, has become associated with Lerke & Whortan, consulting geologists in that city. Mr. Beebe recently resigned as district geologist for British American Oil Producing Co., in charge of exploration in Kansas, Illinois, Indiana and Kentucky.

T. J. BUSH, production supervisor of Lago Petroleum Corp. in Maracaibo, Venezuela, is spending his vacation in Tulsa and Seminole, Okla. On September 27 he married MAXINE MELOTT, Shawnee, Okla., in Fort Smith, Ark. Mr. and Mrs. Bush will make the trip to South America by steamer.

T. LEO MOORE, independent oil operator; H. A. DECKER, of Decker Tool & Supply Co., and T. E. SHAW, superintendent of Texas Co. gasoline division, all of Electra, Tex., were in charge of arrangements for the third annual chuck-wagon party held there October 24. Some 1,500 employes and officials of oil companies were at the party, which was sponsored by the oil bureau of the Electra Chamber of Commerce.

ROBERT S. STEWART, general manager of the near-eastern division of Socony-Vacuum Oil Co., Inc., sailed for his post in Cairo, Egypt, after a vacation in this country.

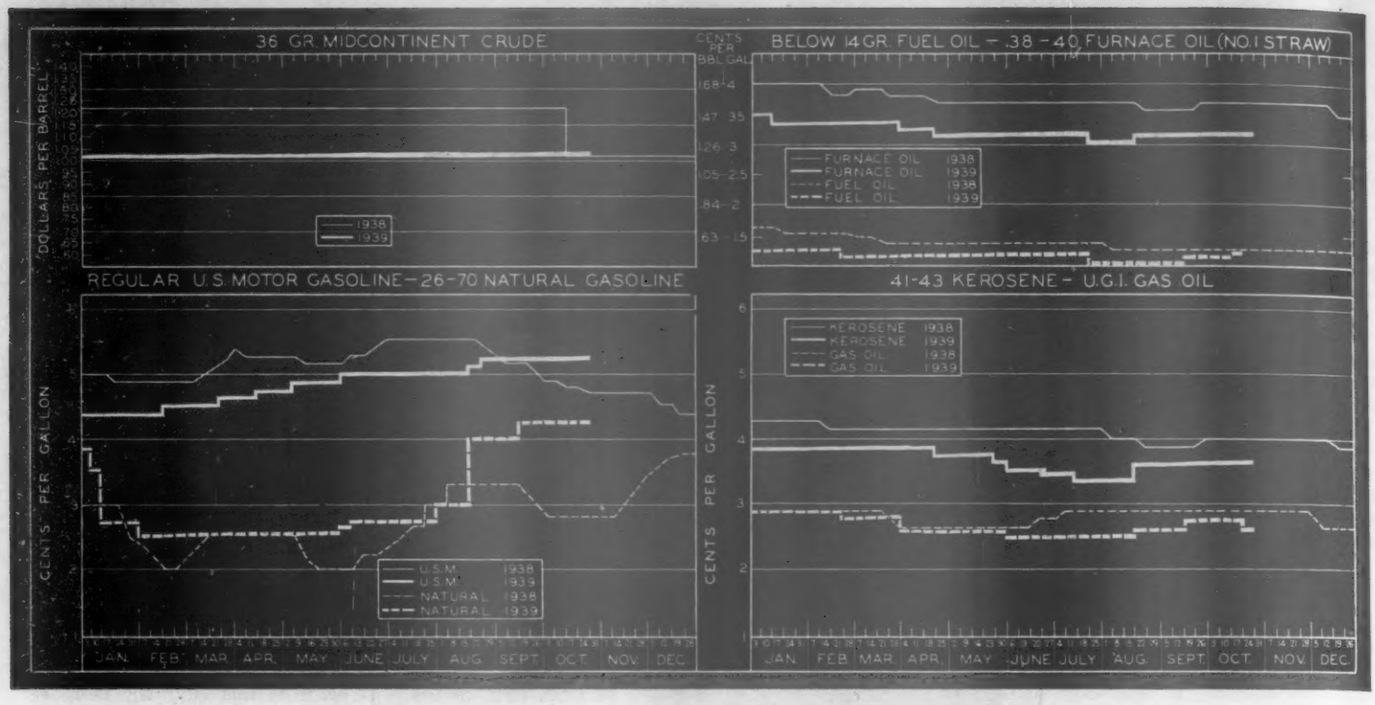
JOSEPH WILLIAMS, chief engineer, and FRANKLIN HACKBUSCH, engineer, both with Magnolia Petroleum Co., Dallas, Tex., are back in their offices after having been absent owing to lengthy illnesses.

GRADY VAUGHN, drilling contractor of Dallas, Tex.; GRANT LINDSAY, Lafayette, La., and H. W. KLEIN, Dallas, have organized Dixie Drilling Co., Inc., with offices in Dallas. Mr. Vaughn and Mr. Klein are part owners of Big West Drilling Co., Dallas.

Shifts: R. D. CLARK, engineer Carter Oil Co., from Beloit, Kans., to Atchinson, Kans.; J. H. DRUEGER, geologist Hill & Hill, from Burlington, Wis., to McAllen, Tex.; L. D. BECHTEL, superintendent Ohio Oil Co., from Medicine Bow, Wyo., to Kyle, Wyo.; J. D. McCLURE, geologist Barnsdall Oil Co., from Holland, Mich., to Grand Rapids, Mich.; H. L. CROCKETT, geologist Ohio Oil Co., from Bethany, Mo., to Lawrence, Kans.; H. S. AUSTIN, Standard Oil Co. of New York, from London, England, to Elizabeth, N. J.; W. G. CORWIN, in charge of production for Socony-Vacuum Oil Co., Inc., from The Hague, Holland, to New York; W. P. JENNY, geologist, from Berne, Switzerland, to Houston, Tex.; T. B. KNOX, drilling contractor, from Breckenridge, Tex., to Artesia, N. M.; DWIGHT FARTHING, contractor, K. & F. Engineering Service, from Assumption, Ill., to Rolla, Mo.; T. L. SMITH, JR., president Smith Salvage Co., from Houston, Tex., to West Columbia, Tex.; K. M. LAWRENCE, geologist Amerada Petroleum Corp., from Plainview, Tex., to Jasper, Ala.; K. M. McGOLDRICK, E. W. McGoldrick Oil Co., from Shreveport, La., to Norman, Okla.; C. A. BENSON, engineer Phillips Petroleum Co., from El Dorado, Ark., to Rodessa, La.; R. E. WISE, engineer Continental Oil Co., from East St. Louis, Ill., to Ville Platte, La.; LELAND ANDERSON, director Seaport Oil Corp., from New York to Houston, Tex.

TED HENRY, vice president of Atlantic Oil & Refining Co., Philadelphia, accompanied by Mrs. Henry, was a visitor in the district offices of the company at Dallas, Tex., last week.

AMOS BALL, general manager of sales for Standard Oil Co. (Ind.) since 1926, has been made vice president in charge of sales. He succeeds ALLAN JACKSON, who will continue as vice president and director while devoting his attention to special studies. R. F. McCONNELL succeeds Mr. Ball as general manager of sales and will be active head of the sales force. H. E. HANSON becomes assistant general manager in the sales division. H. J. BEMIS, formerly manager at Davenport, Iowa, becomes assistant general manager of the eastern division. R. F. BAITY, formerly in the general office, Chicago, is made manager at Davenport. C. H. LAMOREAUX, assistant manager at Milwaukee, Wis., succeeds Mr. Baity; O. V. SAPPENFIELD, assistant manager at Peoria, Ill., succeeds Mr. Lamoreaux; E. M. ERSKINE, sales promoter-reseller at South Bend, Ind., succeeds Mr. Sappenfield.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Group 3 Market Shows Less Energy but Lubes and Wax Hold Ground

By T. F. SMILEY

Though far from being sluggish, the Group 3 refinery market had lost a little of its enthusiasm this week. An all-time high of 3,600,000 bbl. daily in crude runs to stills, recorded in the week ending October 14, was a sobering influence. So were gasoline stocks of 71,263,000 bbl., 2,091,000 more than in the corresponding week of 1938, when refiners were being urged to restrict their operations and get inventories to an economic level. Dislocated ocean transport, which continues to aggravate congested conditions at Gulf terminals, showed signs of improvement.

Heavy Tendency in Gasoline

One reason for a tendency to heaviness in the gasoline market was the big purchases during the past 2 months by jobbers and dealers who believed higher prices were likely. This precautionary building up of supplies helps to explain the gain of 8.7 per cent in domestic demand during the first 9 months of this year over that of the first 9 last year—421,511,000 bbl. against 388,745,000 in 1938. Domestic and foreign demand for September is estimated to have exceeded that of 1938 by 7 per cent. Before the Mid-Continent gasoline market can recover the vigorous tone it exhibited at the close of the crude shutdown last August more substantial inroads will have to be made on stocks laid in by distributors.

The worries of the jobber, who is in need of better tank-wagon prices, are a subject of increasing comment in the trade. When Sinclair Refining Co. last June made an ineffectual effort to raise tank-wagon gasoline prices both jobbers and refiners were suffering from the low levels of their returns. Since then the Group 3 tank-car price has undergone two advances, each of an eighth cent. But tank-wagon prices in Standard of Indiana marketing territory were not raised, with the result that the jobber, already getting a smaller margin of profit than he believed he was entitled to, was compelled to sacrifice a further quarter cent on each gallon handled.

Gasoline consumption is maintaining a high level, largely as a result of pleasant driving weather. Refiners said there were few, if any, soft spots left in the Oklahoma tank-car market, virtually all material that had been looking for homes having found them.

Wax was even tighter than it had been the week before. Quotations for 124-126 white crude scale remained at 5¼ to 5½ cents.

Neutrals and bright stocks, which began their spectacular advance in mid-September, surrendered no ground, but contented themselves with the prices of the preceding week. Material at Gulf ports awaiting shipment oversea was reported to have begun moving out slowly. Thousands of barrels of lubricating oils had accumulated at the Gulf. Other thousands, already ordered, were at Oklahoma plants, waiting for material at the Gulf to make room for them. It was hoped that gradual movement of cargoes to oversea destination would afford the relief needed at overstocked refineries.

Natural Gasoline Prices Holding

Natural gasoline was strong, with Oklahoma and Texas quotations unchanged. "Nobody is fighting for material," one manufacturer put it, "but also nobody is willing to sell below established prices." Two export inquiries were in hand during the past week, and some business had been placed. Refiners at the Gulf Coast who have been withholding shipping instructions on natural gasoline which they had ordered are beginning to request delivery.

Heating oils, at unchanged prices, were moving from plants at a satisfactory rate, considering that warm temperatures continue to prevail over wide northern areas. Kerosene was not in heavy demand, but it was moving in fair volume. Heavy industrial fuel was more active.

Refined Oil Market Barometer

Except for advances scored by some Pennsylvania lubricants and the continued strength of wax, the market in most areas exhibited a slowing-up tendency, attributed in part to a conviction that early predictions regarding the stimulating effect of the war had been extravagant. Overheavy gasoline stocks and excessive runs to stills are causing concern. Heavy industrial fuels gain.

MID-CONTINENT. Gasoline giving ground. Lubricants and wax strong. Heating oils steady.

EAST COAST. Gasoline less vigorous. Heating oils and kerosene gaining. Residual fuels strong.

GULF COAST. All gasolines except aviation grade weak. Kerosene and fuel oils firmer.

CALIFORNIA. Market listless. Competitive grades of gasoline weak. Heating oils stronger.

PENNSYLVANIA. Bright stocks and 200-viscosity neutrals up. Gasoline dull.

CHICAGO. Gasoline quiet. Heavy fuels in active demand. Heating oil and kerosene steady.

War Demand Taking Secondary Place in East Coast Markets

By H. STANLEY NORMAN

NEW YORK, Oct. 24.—Effective today Socony-Vacuum Oil Co., Inc., raised tank-car gasoline prices .1 to .2 cent per gallon throughout New York and New England, with the exception of western New York and parts of Vermont. In certain sections of Vermont tank-car prices of Mobilgas were reduced .1 to .2 cent in anticipation of a rail-rate reduction scheduled for November 1. The general increase in tank-car prices reflects the rise and current firmness in tanker rates between Gulf Coast and North Atlantic terminals.

For the first time in more than 6 weeks petroleum markets along the North Atlantic seacoast appeared this week to be crowding potential war demand into the background as a secondary consideration. All branches of the industry are growing more doubtful that warfare will fulfill earlier predictions of increased consumption. If the neutrality law is amended, most observers predict a bulge in the internal demand for heavy fuels and lubricating oils by the industries which would be thrown into high gear producing war supplies.

The upward movement of prices for petroleum products has leveled off, at least temporarily. Some of the less optimistic observers are again examining motor-fuel inventories as a potentially weak spot in the market structure. Under the impetus of increased refinery operating rates, motor-fuel stocks have turned upward again. Domestic consumption is touching new seasonal records, according to preliminary reports for October.

Some individual refining companies report they are pinched to meet current demand for virtually all products and in extreme cases recourse to the open market has been practiced.

There has been no important change in the tanker situation, although prices have advanced for coastwise movement in November and December. At least a half dozen boats were chartered last week for November coastwise movement at rates from 32 to 36 cents per barrel, depending on the type of product loaded. One Norwegian vessel was fixed for a trans-Atlantic trip to Norway in November at about $6.37 per ton. A boat was fixed for loading in Bahrein and delivery in South Africa next month at $8 per ton, and another tanker was engaged for the Aruba-to-Brazil run in November at $4.50 per ton. Several other boats were reported "gone" with no added detail indicating that they were loaded and dispatched to belligerent countries in Europe or to neutrals with discharge ports reached only by passing through zones of greatest danger.

Although it was impossible to obtain detailed information on the movement of tankers in trade with other than Western Hemisphere neutral countries, there appeared to be a slackening in the transportation conditions. Rumors circulated in New York last week that British and French tankers have been concentrated on movement from the Near East through the Mediterranean, as a hedge against the possible blockade of that artery in event of Italian participation with Germany or unfavorable alliances between the Reich and some of the Balkan states.

In this connection, it was pointed out that Iran production is normally restricted to current demand, but that potentially the fields there are capable of much heavier output.

Rumors were heard last week that an advance of a quarter to a half cent per gallon in the New York tank-wagon gasoline price would be posted before the end of October. The metropolitan area was not included in the middle-of-October advances posted in upper New York State and in several New England points. Tank-car prices for 65-octane gasoline remained unchanged at New York, Philadelphia, and Boston. Most suppliers are quoting 6¾ cents per gallon, although limited material is available at 6⅝ or even 6½ cents, according to reports.

Colder temperatures prevailed in the northeastern section from New York north last week and the tank-wagon demand for domestic burning oils responded accordingly. Several suppliers are asking 4⅝ to 4⅞ cents per gallon for No. 2 fuel oil and the tank-wagon price ranges from 6¼ to 6½ cents. Kerosene is moving forward both in prices and demand in pace with the heavier burning oil and most New York suppliers are asking from 5 to 5⅛ cents per gallon in tank cars. A general tank-wagon advance on kerosene was posted 2 weeks ago in the northeastern territory by Socony-Vacuum Oil Co., Inc., and practically all distributors have followed the upward movement because of higher costs prevailing on the Gulf and in eastern refining centers.

The upward movement of lubricating-oil quotations was temporarily halted in the western Pennsylvania refining district last week. Quoted prices have moved forward roughly 10 cents per gallon since September 1, an advance of 66 per cent. Some of the leading Pennsylvania refiners have cautioned against further advances claiming that the policy will permanently drive domestic customers into other markets for their lubricating oil requirements. It is recognized in the trade that quoted prices on Pennsylvania lube oils are entirely fictitious, with the exception of export business, and that a large majority of the business is conducted under contracts with a "top price" clause which is substantially lower than spot quotations.

Bunker C fuel oil remains unchanged at $1.15 per barrel in New York but the market for residual fuels is considered strong. Most observers anticipate that marine fuel and aviation gasoline, along with lubricating oils, will constitute the bulk of any increased export demand accruing to American refiners for the duration of European warfare.

Wax is scarce on both the New York and New Orleans markets with prices generally unchanged. Some suppliers have withdrawn from the domestic market and are quoting exclusively for export at prices ranging from 5 to 5.2 cents per pound.

A. P. I. Weekly Refinery Statistics

Week Ended October 21, 1939

	Capacity reporting (per cent)	Daily crude runs (bbl.)	Total gasoline stocks	Gas oil and fuel oil stocks
East Coast	100.0	608,000	18,427,000	13,521,000
Appalachian	85.9	119,000	2,706,000	621,000
Indiana, Illinois, and Kentucky	90.2	541,000	10,946,000	6,794,000
Oklahoma, Kansas, and Missouri	81.6	252,000	6,022,000	4,517,000
Inland Texas	50.3	119,000	1,557,000	2,286,000
Texas Gulf	90.0	829,000	9,291,000	13,248,000
Louisiana Gulf	97.8	160,000	2,439,000	3,047,000
North Louisana and Arkansas	55.0	47,000	389,000	860,000
Rocky Mountains	54.2	47,000	1,002,000	567,000
California	90.0	572,000	14,293,000	92,770,000
Total reported	86.2	3,294,000	67,072,000	138,231,000
East unreported	.....	356,000	5,050,000	3,265,000
*Estimated total	.....	3,650,000	72,122,000	141,496,000
*Estimated total previous week	.....	3,600,000	71,263,000	140,417,000
*October 22, 1938	.....	3,251,000	69,215,000	152,823,000

*Bureau of Mines, currently estimated.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ending October 14, 1939	229,870,000 barrels
Week ending October 7, 1939	231,564,000 barrels
Week ending October 15, 1938	277,001,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

Gulf Coast Markets

HOUSTON, Tex., Oct. 24.—Further slipping of motor fuels was evident in Gulf Coast refinery markets over the week end, with all grades available at prices easily a quarter cent under prevailing quotations a week ago. All other products maintained their strong positions, supported by limited supplies and prospects of renewed demand.

Although some sellers continued to quote as high as 6½ cents for 68-70 octane motor fuel, it would be freely available at 6¼ cents if there were any takers. Refiners openly admit it now is only a question of getting business. Sellers Monday were quoting 65-octane material at 6 cents with some offerings reported at 5¾ cents. Lower grades were going begging at 5½ to 5¾ cents.

Unsold stocks reported by members of the Gulf Coast Refiners Association have been mounting steadily. Although these may represent a small percentage of the total on the

(Continued on Page 191)

Retail Oil Markets

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of October 24, 1939

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline			Kero.
	Tank wag.	Dlr.	Inc. tax	tank wag.
Chicago, Ill.	15.1	13.1	4.0	10.0
Decatur	15.1	12.1	4.0	8.5
Joliet	15.1	13.6	4.0	10.0
Peoria	15.1	13.6	4.0	10.0
Quincy	14.9	13.4	4.0	9.8
Davenport, Ia.	15.1	13.6	4.0	‡10.0
Des Moines	14.9	13.4	4.0	‡9.8
Mason City	15.3	13.8	4.0	‡10.2
Duluth, Minn.	16.9	15.4	5.0	10.8
Mankato	16.5	15.0	5.0	9.4
Minneapolis	16.5	15.0	5.0	10.4
LaCrosse, Wis.	16.5	15.0	5.0	10.4
Green Bay	16.9	15.4	5.0	10.0
Milwaukee	16.3	14.8	5.0	10.2
Detroit, Mich.	13.6	12.1	4.0	7.6
Grand Rapids	13.5	12.0	4.0	9.7
Saginaw	14.8	13.3	4.0	9.3
Evansville, Ind.	16.6	15.1	5.0	†10.5
Indianapolis	16.8	15.3	5.0	†10.7
South Bend	16.8	15.3	5.0	†10.0
Fargo, N. D.	17.7	16.2	5.0	11.6
Huron, S. D.	17.0	15.5	5.0	10.9
Kans. City, Mo.*	14.4	12.9	4.0	8.0
St. Louis*	14.7	13.2	4.0	8.0
St. Joseph	14.4	12.9	4.0	7.9
Wichita, Kans.	13.3	10.6	4.0	7.4

*State tax 2 cents, 1-cent city tax and 1-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective September 18, 1939, f.o.b. Chicago tank-wagon prices: Standard range oil, 1-99 gal., 9 cents; 100-149 gal., 8 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-149 gal., 8.25 cents; 150-399 gal., 7.25 cents; 400 gal. and over, 6.75 cents. Stanolex furnace oil, 1-149 gal., 8.25 cents; 150-399 gal., 7.25 cents; 400 gal. and over, 6.75 cents. Stanolex Grade A, 1-399 gal., 5.25 cents; 400 gal. and over, 4.25 cents. Stanolex Grade B, 1-799 gal., 5.25 cents; 800 gal. and over, 4.25 cents. Stanolex Grade C, 1-999 gal., 4.5 cents; 1,000 gal. and over, 3.5 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Tank-wag. cons'r.	Dlr. vided	Inc. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.0	*13.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline			Kero.
	Cons'r. tank car	Dlr. tank wag.	Inc. tax	tank wag.
Atl'tic City, N. J.	11.6	12.7	4.0	7.60
Newark	11.6	12.7	4.0	7.60
Annapolis, Md.	13.35	14.35	5.0	9.5
Baltimore	12.75	13.75	5.0	7.0
Cumberland	14.15	16.15	5.0	10.0
Wash'gton, D. C.	11.00	12.0	3.0	9.5
Danville, Va.	14.95	17.45	6.0	12.9
Norfolk	13.75	16.25	6.0	10.0
Petersburg	14.05	16.55	6.0	11.7
Richmond	14.05	16.55	6.0	10.7
Roanoke	15.25	17.75	6.0	11.0
Charles'n, W. Va.	14.55	17.05	6.0	12.6
Parkersburg	13.85	15.35	6.0	11.2
Wheeling	14.85	16.75	6.0	12.2
Charlotte, N. C.	16.90	18.40	7.0	11.8
Hickory	17.45	18.95	7.0	12.3
Mt. Airy	17.30	18.80	7.0	12.2
Raleigh	16.65	18.15	7.0	11.5
Salisbury	16.95	18.45	7.0	11.9
Charleston, S. C.	14.75	17.25	7.0	10.6
Columbia	15.60	18.10	7.0	11.5
Spartanburg	16.30	18.80	7.0	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gallons, consumer tank-wagon price at time and place of delivery; 100,000 gallons per year, consumer tankcar price plus .5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less .5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gallons or more, consumer tank-wagon price. Single deliveries of less than 50 gallons, 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less .5 cent per gallon. The above policy also applies in South Carolina effective January 23, 1939.

Discounts for kerosene, 1 cent off tank-wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except no discount in New Jersey.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline			Kero.
	Cons'r. tank-wag.	Net dlr.	Inc. tax	tank-wag.
Atlanta, Ga.	20.0	17.0	7.0	10.0
Augusta	20.5	17.5	7.0	10.0
Macon	21.0	18.0	7.0	10.5
Savannah	19.5	16.5	7.0	9.0
Birmingham, Ala.	21.5	18.5	8.0	9.0
Mobile	21.5	18.5	9.0	9.0
Montgomery	22.5	19.5	9.0	11.0
Jackson, Miss.	19.5	16.5	7.0	10.0
Vicksburg	19.5	16.5	7.0	9.5
Jacksonville, Fla.	19.0	16.0	8.0	8.5
Miami	19.5	16.5	8.0	7.0
Pensacola	21.5	18.5	9.0	8.5
Tampa	20.5	17.5	8.0	8.5
Lexington, Ky.	19.5	16.5	6.0	10.0
Covington	18.0	15.0	6.0	9.5
Louisville	18.5	15.5	6.0	9.0
Paducah	18.5	15.5	6.0	9.0

Price basis to tank-wagon consumers: Effective January 4, 1937; 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline			Kero.
	Cons. tank-car	Dlr. tank-wag.	Inc. tax	tank-wag.
Philadelphia, Pa.	12.0	13.5	5.0	10.0
Pittsburgh	13.0	14.5	5.0	10.5
Allentown	12.5	14.0	5.0	10.5
Erie	13.0	14.5	5.0	10.0
Scranton*	13.0	14.5	5.0	10.5
Altoona	13.0	15.0	5.0	10.5
Dover, Del.	...	14.0	5.0	10.5
Wilmington	...	13.5	5.0	9.75

Price basis to undivided dealers, dealer tank-wagon price less .5 cent per gallon. *Voluntary discount of 1 cent allowed to dealers only.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline			Kero.
	Cons. tank-car	Dlr. tank-wag.	Inc. tax	tank-wag.
Albany	12.3	14.6	5.0	7.80
*Met. N. Y.:				
Manhat. Bronx	12.4	13.4	5.0	8.00
Queens, Br'klyn	12.4	13.4	5.0	8.00
Staten Island	12.4	13.4	5.0	8.00
Buffalo	13.1	14.5	5.0	7.70
Rochester	13.3	14.0	5.0	8.30
Syracuse	12.9	14.5	5.0	8.30
Boston	11.3	13.0	4.0	8.00
Portland, Me.	12.3	14.3	5.0	8.00
Manchester, N. H.	13.0	15.0	5.0	8.40
Burlington, Vt.	12.9	14.5	5.0	8.20
Springfield, Mass.	12.0	13.5	4.0	8.20
Worcester	11.9	13.5	4.0	8.20
Hartford, Conn.	11.7	13.3	4.0	7.90
New Haven	11.6	12.8	4.0	8.00
Providence, R. I.	11.3	13.3	4.0	8.00

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Effective February 15, 1939, the company changed its commercial consumer policy in New York and New England points for tank-wagon delivery to the following: Annual purchases 10,000 gallons and under, tankcar price plus 2 cents per gallon; annual purchases 10,000 gallons up to 50,000 gallons, tankcar price plus 1.5 cents per gallon; annual purchases 50,000 to 200,000 gallons, tankcar price plus 1 cent per gallon; annual purchases 200,000 gallons and over, tankcar price plus one-half cent per gallon. Private consumers pay undivided dealer price, plus 2 cents per gallon. Private consumers receiving full compartment deliveries of at least 200 gallons receive a discount of one-half cent per gallon.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline			Kero.
	Tank-truck	Serv. sta.	Inc. tax	tank-wag.
San Francisco	17.5	18.5	4.0	11.5
Los Angeles	17.0	18.0	4.0	10.0
Fresno, Calif.	18.5	19.5	4.0	12.5
Phoenix, Ariz.	20.0	21.0	6.0	*17.5
Reno, Nev.	20.5	21.5	5.0	13.5
Portland, Ore.	20.0	21.0	6.0	13.5
Seattle ,Wash.	20.0	21.0	6.0	†13.75
Spokane	21.5	22.5	6.0	†16.75
Tacoma	20.0	21.0	6.0	†13.75

*Includes 5-cent state tax. †Includes .25-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gallons and over, advance quantity discount extended at time of delivery, 3 cents. Service station schedule applies on single deliveries less than 40 gallons. On kerosene in tankcar, transport truck and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank-wagon.

March 18, 1939, split dealer discount was canceled.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline			Kero.
	Tank-wag.	Dlr.	Incl. tax	tank-wag.
Denver, Colo.	15.5	...	5.0	11.5
Grand Junction	18.5	...	5.0	15.0
Pueblo	16.0	...	5.0	9.0
Casper, Wyo.	17.5	...	5.0	11.5
Cheyenne	15.5	...	5.0	13.0
Billings, Mont.	18.5	...	6.0	13.0
Butte	20.0	...	6.0	15.5
Great Falls	19.5	...	6.0	15.5
Helena	20.5	...	6.0	15.5
Salt Lake, Utah	17.5	17.5	5.0	16.0
Boise, Idaho	20.6	20.6	6.0	18.0
Twin Falls	21.1	21.1	6.0	18.0
Albu'que, N. M.	17.0	17.0	6.5	10.0
Roswell	15.5	15.5	6.5	8.0
Santa Fe	17.5	17.5	6.5	10.0

*Includes city tax of .5 cent. †Includes state tax of 1 mill.

Tank-wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline			Kero.
	Cons. tank-car	Dlr. tank-wag.	Inc. tax	tank-wag.
New Orleans, La.	15.25	17.75	8.0	†11.0
Baton Rouge	15.25	17.75	8.0	‡10.5
Alexandria	15.25	17.75	8.0	‡12.5
Lafayette	15.00	18.00	8.0	‡11.0
Lake Charles	15.25	17.75	8.0	‡12.5
Shreveport	14.00	16.50	8.0	‡11.0
Knoxville, Tenn.	18.50	21.00	8.0	14.5
Memphis	16.50	19.00	8.0	11.0
Chattanooga	18.00	20.00	8.0	12.0
Nashville	17.50	20.00	8.0	11.0
Bristol	18.75	20.00	8.0	13.0

Essolene at dealer price less .5 cent per gallon to undivided dealers.

†Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gallons or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gallons at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon; 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Nebraska

STANDARD OIL CO. (NEBRASKA)

	Gasoline			Kero.
	Tank wag.	Dlr.	Inc. tax	tank wag.
Omaha	16.9	15.4	6.0	9.8
McCook	16.5	16.2	6.0	9.0
Norfolk	17.3	15.8	6.0	9.5
North Platte	17.8	16.3	6.0	10.7
Scottsbluff	18.5	15.5	6.0	11.4

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline			Kero.
	Tnk.-wg. dlr.	Includes tax		tank wag.
Texarkana, Ark.	14.0	5.0		8.0
Fort Smith	14.5	5.0		7.5
Little Rock	17.25	7.5		9.0
Muskogee, Okla.	13.0	5.0		7.0
Oklahoma City	12.0	5.0		6.5
Tulsa	13.0	5.0		7.0

The tank-wagon price is the price to all classes of trade.

Texas

	Gasoline			Kero.
	Tank wag.	Serv. sta.	Inc. tax	tank wag.
Dallas, Tex.	14.0	18.0	5.0	7.0
Fort Worth	15.0	19.0	5.0	8.0
Houston	14.0	18.0	5.0	8.0
San Antonio	14.0	18.0	5.0	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	15.7
V.M.&P. naphtha	16.0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada*

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Tank wag.	Inc. tax	Kero. tank wag.
Halifax, N. S.	24.0	10.0	18.0
St. John, N. B.	24.0	10.0	18.0
Montreal, Que.	22.5	8.0	15.0
Toronto, Ont.	23.5	8.0	16.0
Hamilton, Ont.	23.5	8.0	16.0
Winnipeg, Man.	26.5	7.0	20.5
Brandon, Man.	28.0	7.0	22.0
Regina, Sask.	26.0	7.0	22.0
Saskatoon, Sask.	28.3	7.0	24.0
Edmonton, Alta.	19.4	7.0	21.4
Calgary, Alta.	23.5	7.0	19.0
Vancouver, B. C.	23.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In maritime provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Socony-Vacuum Oil Co., Inc., October 10 advanced kerosene .3 cent in Albany and Rochester; .75 cent in metropolitan New York, Boston, and Portland; .55 cent in Syracuse; .65 cent in Manchester; .45 cent in Burlington and Worcester; 1.7 cents in Springfield; .9 cent in Hartford; 1.5 cents in New Haven; 1 cent in Providence. Same date, reduced tank-wagon kerosene .5 cent in Buffalo.

Standard Oil Co. of New Jersey October 20 advanced tank-wagon kerosene 1.5 cents in Norfolk, Va.

Standard Oil Co. (Nebraska) October 10 reduced tank-wagon gasoline .5 cent in McCook.

Standard Oil Co. (Kentucky) October 14 reduced tank-wagon and net dealer gasoline 1 cent in Atlanta; October 16, advanced tank-wagon and net dealer gasoline 1 cent in Miami and .5 cent in Tampa; October 16, advanced tank-wagon kerosene 1.5 cents in Augusta and Tampa; October 11, reduced tank-wagon kerosene 1.5 cent in Miami.

Prices of Refined Products

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of October 24, 1939

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 octane and below		.04⅛
63-66 octane	.04⅜	.04⅜
67-69 octane	.04⅞	.05⅛
70-72 octane (regular)	.05¼	.05⅜
60-62 400 grades:		
62 octane and below	.04⅛	.04⅜
63-66 octane	.04⅜	.04⅞
67-69 octane	.04⅞	.05⅛
70-72 octane (regular)	.05¼	.05⅜
68-70 360	.05	.05¼

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below		.04⅛
63-66 octane	.04⅜	.04⅞
67-69 octane	.04⅞	.05⅛
70-72 octane (regular)	.05¼	.05⅜
60-62 400	.04⅛	.04⅜

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
62 octane and below	.04⅝	.04¾
63-66 octane	.05	.05⅛
67-69 octane		.05⅜
70-72 octane (regular)	.05¼	.05½

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
62 octane and below		.04⅞
67-69 octane	no quotations	
70-72 octane (regular)		.05¼

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.04⅛	.04⅝
63-66 octane	.04⅜	.04⅞
67-69 octane	.05	.05⅛
70-72 octane (regular)	.05¼	.05⅝
60-62 400 grades:		
62 octane and below	.04⅛	.04⅝
63-66 octane	.04⅜	.04⅞
67-69 octane	.05	.05⅛
70-72 octane (regular)	.05¼	.05⅝
68-70 360	.05	.05¼

PENNSYLVANIA (inland refineries)—

58-60 U. S. Motor		.05
65 octane	.06½	.07
72-74 octane (regular)	.06½	.07

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.06¼	.08
58-60 400, 65 oct. and higher	.07¼	.09

EAST COAST (domestic)—

U. S. Motor, 65 and above:		
*New York (Bayonne)	.06½	.06¾
Philadelphia	.06¼	.06¾
Baltimore	.06¼	.06¾
Charleston, S. C.	.06¾	.07

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane	.05½	.05⅝
65-67 octane	.05⅝	.06
68-70 octane	.06	.06¼

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.04⅛
Grade 18-55		.05⅛

NORTH TEXAS—

Grade 26-70		.04⅛
Grade 18-55		.05⅛

CALIFORNIA—

75-85 375-390	.05½	.06¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.04⅝

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p.	.03½	.03⅝
41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p.	.03⅝	.03¾
46-48 gr., 210-230 i.b.p., 480-max., e.p.	.03⅞	.04⅛

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.03⅝	.03¾
42-44	.03¾	.03⅞

NORTH TEXAS—

41-43	.03⅝	.03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.03½	.03⅝

ARKANSAS (Ark. and N. La. del.)—

41-43		.03⅝

PENNSYLVANIA (inland refineries)—

45	.04¾	.05
46	.05	.05⅛
47	.05	.05¼

CHICAGO (Based on Group 3)—

41-43	.03⅝	.03¾
42-44	.03¾	.03⅞

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04¾	.05¾

NEW YORK (Bayonne, N. J.)—

41-43	.04⅞	.05

***GULF COAST (domestic)—**

41-43	.04½	.04¾

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03½	.03⅝
No. 1 prime white, 38-42		.03⅝
No. 1 straw, 38-40	.03½	.03¾
No. 2 straw, 32-36	.03½	.03¼
No. 2 dark, 32-36	.02¾	.02⅞
No. 3 zero to 15, 28-32	.02½	.03
No. 3, 15 and above, 28-32	.02⅝	.02¾

NORTH TEXAS—

No. 1 prime white, 38-42	.03⅛	.03⅜
No. 1 straw, 38-40	.03⅛	.03¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03	.03⅛

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	no quotations

CHICAGO (Based on Group 3)—

Range oil	.03⅝	.03⅝
No. 1 prime white, 38-40	.03⅝	.03½
No. 1 straw, 38-40	.03¼	.03⅝
No. 2 straw, 32-36	.03⅛	.03¼
No. 2 dark, 32-36	.03	.03⅛
No. 3, zero to 15, 28-32	.03	.03⅛
No. 3, 15 and above, 28-32	.02¾	.02⅞

NEW YORK (Bayonne, N. J.)—

*No. 1	.04¾	.05
*No. 2	.04⅝	.04½
*No. 4	.04¼	.04½

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.02⅝	.02¾
No. 5, low pour point, 18-22	.70	.75
Below 14 fuel oil, industrial	.47½	.50

NORTH TEXAS—

U.G.I. gas oil, under 35	.02⅝	.02¾
No. 5, low pour point, 18-22	.70	.75
Below 14 fuel oil, industrial	.47½	.50

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.70	.75

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02⅝	.02⅞
No. 5, low pour point, 18-22	.70	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 10-16	.45	.50

PENNSYLVANIA (inland refineries)—

36-40	.04⅛	.04½

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.15	1.30
24 plus diesel, per bbl.	1.00	1.30
24 plus diesel (bunkers)	1.30	1.40
12-16 (bunkers at tidewater)	.70	.90
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.60	.85
10-17 (high sulfur)	.50	.70
San Joaquin Valley:		
10-18 (tank cars)	.55	.75
24 plus diesel, per bbl.	1.00	1.25
San Francisco:		
24 plus diesel, per bbl.	1.45	1.50
24 plus diesel (bunkers)	1.55	1.60
10-16 (bunkers)	.90	.95

GULF COAST—

No. 2 fuel		.04¾
43-47 diesel		.04
48-52 diesel		.04¼
53-57 diesel		.04½
58 and above diesel		.04¾
Bunker C (bulk cargoes)	.95	1.00
Bunker C (bunkers)	.95	1.00

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04¼
28-30 diesel (lighterage 6¼c per bbl.)		1.75
28-30 diesel (tank cars)		.04¼
Bunker C (to ocean-going ships in N. Y. Harbor)		1.15
Industrial fuel (tank cars)		.04

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

190-200 D, 15-25	.26
150-160 D, 0-10	.23
150-160 D, 15-25	.22
150-160 E, 15-25	.22
100-110 D, 0-10	.22
Steam-refined:	
600 dark green (untreated)	.07

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point	.29	.33
15 pour point	.28	.32
25 pour point	.24½	.30
Steam refined:		
600	.13½	.17
650	.15	.20
600 flash	.15½	.20½
630 flash	.19	.23

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.12
180-3		.13
180-4		.12½
200-3		.13½
200-4		.13
250-3		.14½
250-4		.14
280-3		.15½
280-4		.15
300-3½		.16
400-3½		.17
100-2½ paraffin oil		.06¾
15-25 pour point:		
200-3		.13
200-4		.12½
250-3		.14
250-4		.13½
280-3		.15
280-4		.14½

GULF COAST—

Pale oils:		
200-3	.06½	.07
300-3	.07	.07¼
500-3½	.08	.08¼
750-3½	.08	.08½
1,200-3½	.09	.09½
2,000-4	.09½	.09¾
Red oils:		
200-5-6	.06¼	.06¾
300-5-6	.06¾	.07
500-5-6	.07¾	.08
750	.07¾	.08
1,200-5-6	.08¾	.09¼

CALIFORNIA (moving to dom. market)—

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		.32½
10 pour point		.31½
15 pour point		.30½
25 pour point	.23	.28
200 vis. at 70° F., 3 color:		
Zero pour point		.34½
10 pour point		.33½
15 pour point		.32½
25 pour point	.25	.30

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.0525	.0550

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale	.0450	.0500
124-126 (A.m.p.) w.c. scale	.0490	.0525

NEW YORK—

Wax in bags fully refined:		
123-125 (A.m.p.) wax		.0435
125-127 (A.m.p.) wax		.0455
128-130 (A.m.p.) wax		.0460
130-132 (A.m.p.) wax		.0485
133-135 (A.m.p.) wax		.0515
135-137 (A.m.p.) wax		.0540
124-126 (A.m.p.) w.s.	.0450	.0500
124-126 (A.m.p.) y.s.	.0450	.0500
Petrolatum in barrels, carload lots:		
Dark green	.02	.02¼
Amber	.02⅜	.02½
Extra amber	.02⅝	.02¾
Lily white	.05½	.05¾
Snow white	.06½	.06¾
Cream	.04⅛	.04¼

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.05	.05¼
60-62 400	.05½	.06
65 octane	.06¼	.06½
68 octane	.06¾	.07
70 octane	.07	.07½

LOS ANGELES—

U. S. Motor grades:		
55-65 octane	.04¾	.05
65-69 octane	.05¼	.05½
Above 69 octane	.05½	.06

KEROSENE

GULF COAST—

41-43 prime white		.05¼
41-43 water white		.05¼

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s) in bbls.—

Cylinder stocks:		
600 S.R. unfiltered	.25	.26½
650 S.R. unfiltered	.27	.28½
600 flash, S.R.	.28	.30½
630 flash, S.R.	.30	.34
Bright stock:		
8 color	.40	.42

NEUTRAL OIL

200-3 color	.38	.43
150-3 color	.37	.40

PARAFFIN WAX

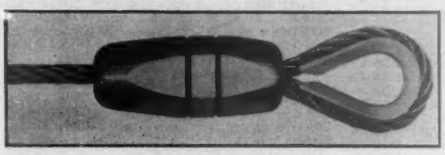
NEW YORK (prices per pound)—

123-125 A.m.p.		.0435
125-127 A.m.p.		.0455
128-130 A.m.p.		.0460
133-135 A.m.p.		.0515
135-137 A.m.p.		.0540
Crude scale:		
124-126 w.s.	.0450	.0500
124-126 y.s.	.0450	.0500

New or Improved Equipment

Strong Grip and Safety Mark Safe-Line Wire-Rope Clamp

The Safe-Line wire-rope clamp, manufactured and marketed by National Production Co., Detroit, Mich., embodies neatness in streamline design, double hold-



ing power, ease of assembly, and safety for employes. The inner surface that grips the wire rope is double spiral splined to fit each strand and wire of the rope, thus making a secure grip on each section of each wire and strand. The gripping halves of the clamp are held tightly to the rope by taper-threaded nuts. The clamp is made of high-tensile-strength steel and is guaranteed to outpull any wire rope made. Stock sizes are for ⅛ to ¾-in. ropes.

Safety engineers are said to endorse it because it leaves no sharp wire ends or projections to injure men who work with it. A joint made with a Safe-Line clamp can be quickly readjusted to the proper tension without additional expense, and it can be used over and over again. Holding power, correct mechanical design, safety and economy are claimed for this device by the manufacturers.

Dowell Acid-Jet Gun Expands Scope of Chemical Service

A new era in chemical service for oil and gas wells is said to be ushered in with the announcement by N. R. Crawford, general manager of Dowell, Inc., of the acid-jet gun. Mr. Crawford says the scope of chemical service for oil and gas wells has been greatly expanded through the development of this tool, which increases the scope of acidizing by making possible the treatment of wells heretofore considered untreatable and greatly improving the technique of acidizing.

Introduced and perfected by Dowell, the acid-jet gun is designed to be run on the end of, or as a section of, the regular tubing string. It may be used in conjunction with various auxiliary chemicals, packers, circulating tools or release valves and may be raised, lowered or rotated during the process to accord effective jetting on the entire section desired to be treated.

It is said this tool permits streams of acid to be shot out horizontally or vertically against the walls or bottom of the well bore. The acid is projected through small-diameter nozzles, designed for effectively removing Dowmetal pipe, cement, lime and calcareous deposits at a distance of 15 in. from the nozzle. This action, it is said, may be obtained under fluid such as oil, water, acid or any fluid of approximately the same viscosity as acid, at 1,000 lb. per sq. in. differential pressure across the jets.

Bovaird Store in Grayville

D. W. Cunningham is manager of a new store opened by Bovaird Supply Co. in Grayville, Ill. He formerly

was field salesman at the company's branch in Salem, Ill., and before that held a similar position at the Russell, Kans., branch. At Grayville Bovaird will carry a complete stock of tubular goods and of drilling and pumping equipment especially adapted for that territory. Mr. Cunningham will be assisted by adequate trained personnel.

Hal Motheral on Gilmer Staff

Hal Motheral, who is a native Texan, is a member of the sales staff of L. H. Gilmer Co., Tacony, Philadelphia, Pa., working out of the company's branch in Houston, Tex.

He knows the oil fields and in his present post he is specializing on the Gilmer line of V-belts and Kable Kord flat belting.

FAILING NOW HOUSED IN COMMODIOUS NEW QUARTERS

Opening of commodious new quarters of George E. Failing Exploration & Drilling Co. and George E. Failing Supply Co. at 3611 Calhoun Street, Houston,

Tex., was celebrated recently when several hundred oil men were guests at a barbecue dinner. The new plant contains all the shops, stock rooms, and offices for operations on the Gulf Coast. The building, which has a 185-ft. front, is of stucco, brick and steel. The shops are equipped for making or repairing any core-drill unit. The stock rooms carry core-drill parts and equipment ready for immediate shipment.

Provision has been made for expansion. One full block and additional adjoining space, amounting to 70,000 sq. ft., make up the property. Of this area 35,000 sq. ft. is utilized by the present office, warehouse, garage and shops.

George E. Failing Supply Co. specializes in the manufacture of core-drilling equipment, and manufactures 23 various types of rigs. The two companies entered the Gulf Coast area in 1930, and since 1932 their operations there have been directed by T. E. Failing. General headquarters are in Enid, Okla.

Witte Engines Protected From Damage by Dust, Dirt, Sand

The engine shown here is a late-model 8-hp. Type K Witte engine, made by Witte Engine Works, Kansas City, Mo. It is equipped with a belt-driven fan and

radiator for cooling. It has a dual carburetor for starting on gasoline and running on natural gas. This particular installation in the Salem field in Illinois is one of a number operated by a major oil company.

Witte Type K engines are enclosed, self-oiling, with Timken roller bearings and are made in 2 to 10-hp. sizes. They have enclosed crank and gear case, giving protection against dust, sand, and dirt, and cutting out of piston and bearings, thus insuring a more quiet and cleaner engine with protection against anything dropping into the works while they are in motion. The enclosed construction makes the engines especially valuable for use in dusty and sandy locations.

Self-oiling is accomplished by a small blade dipping into a bath of clean oil in the bottom of the engine bed and distributing it equally by splash system to all parts within the crankcase. This automatically lubricates piston, rod, bearings and governor without waste. Timken roller bearings are furnished on the crankshaft.

Witte engines are of four-cycle, horizontal, valve-in-the-head type, hopper and radiator-cooled, with throttling governor and high-tension magneto jump-spark ignition.

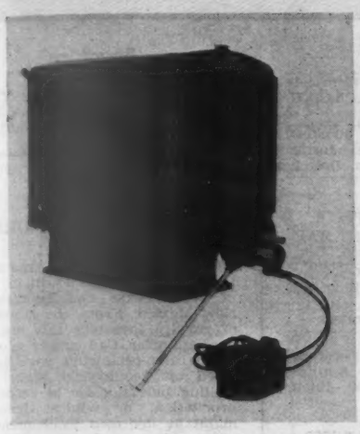
Glass Front of Indicating Gage Protected From Breakage

Ashcroft American Gauge Division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn., announces a new development which is said to eliminate the breakage of glass fronts on indicating gages. Instead of using the conventional glass and gage ring, this device is made out of a nonbreakable transparent plastic in the form of a cover, which threads onto the gage case. It is called the "transparent gage cover" and is as clear as crystal. It is made out of transparent plastic. It has a tensile strength of about 5,000 lb. per sq. in. and a compression strength of about 15,000 lb.

The transparent gage cover opens up the dial of the gage and makes it much easier to read. It also makes the case moistureproof and dustproof. It is available on 4½ and 6-in. phenol case Duragauges.

Theft Ended and Cost Reduced by Portable Electric Starter

A new portable electric unit designed for starting oil-field pumping engines and for general utility service has been introduced by Bakewell Manufacturing Co., 2427 East Fourteenth Street, Los Angeles, Calif. This unit, weighing only 57 lb., can be easily transported by the field operator in a car, along with a 12-volt storage battery and 25 ft. of cable to connect with the starter when it is mounted on the engine. It will start engines up to 1,128-cu. in. displacement.



The Jumbo portable electric starter, according to the manufacturer, reduces costs by making it unnecessary to order each engine equipped with starter, generator and batteries. It eliminates theft of batteries, generators, and starting motors on isolated power units and is designed to decrease accidents incident to cranking engines by hand. Illustrated literature may be obtained from the manufacturer.

Agency for Echometer Service Established in Mount Vernon

A new Echometer agency has been established in Mount Vernon, Ill., to serve the Illinois, Kentucky and Indiana area. The latest type of Echometer equipment has been installed for measuring fluid levels, potentials, and other characteristics of producing wells. The recorder is of the newest direct-writing type, which gives an immediate ink record and eliminates the delays of photographic recording and developing. The rapidity with which fluid-level shots may be made, due to the new recording equipment, is said to result in measurements of the highest accuracy, as small changes in fluid level can be measured quickly and the effects of pressure, etc., determined.

The equipment is mounted on a ¾-ton high-speed truck. Measurements may be made on wells having casing-head pressures as high as 1,200 lb.

The Mount Vernon Echometer agency is headed by Dan Elam, a graduate petroleum engineer from the University of Kansas, assisted by Fred Nussbaumer, a graduate civil engineer from Kansas State University.

Franklin Tool Goes to Evansville

General offices of Franklin Tool Co. will be transferred November 1 from Mount Pleasant, Mich., to Evansville, Ind., where headquarters will be maintained in the Huiman Building. The offices of Jene Harper, president; J. W. C. McKee, secretary-treasurer, and John Schafer, assistant secretary, will be at the new location, as will those of the accounting and clerical departments. The company opened a store October 15 in Carmi, Ill., with Stanley Martin as manager. It will continue to operate branches in Salem, Ill., Lawrence Harper, manager; Mount Pleasant, Mich., W. H. Kerin, Jr., manager; and Allegan, Mich., Floyd Pace, manager. Included in Franklin's line of petroleum equipment are products of Republic Steel Corp., Walworth Co., Worthington Pump & Machinery Corp., International Harvester Co., and Macwhyte Co.

McEwen Enters Rector Service

Rector Well Equipment Co. has appointed W. S. McEwen for engineering and sales work, with headquarters in the home office in Fort Worth, Tex.

Mr. McEwen, who is a graduate in mechanical engineering from Oklahoma A. & M. College, served 2 years on the staff of International Derrick & Equipment Co. in Beaumont, Tex. During the 8 months preceding his connection with Rector Well Equipment Co., he was doing research work for Wallace Davis & Co., in Houston.

Trade Literature

GENERAL ELECTRIC CO., Schenectady, N. Y.—Bulletin GEA-1807B, squirrel-cage induction motors; Bulletin GEA-1698A, wound-rotor induction motors.

BROWN INSTRUMENT CO., Philadelphia, Pa.—Bulletin on new line of thermometers and pressure gages.

INTERNATIONAL NICKEL CO., Inc., 67 Wall Street, New York.—October issue Nickel Steel Topics.

ARMSTRONG MACHINE WORKS, Three Rivers, Mich.—Armstrong Steam-Trap Book, a catalog and informative handbook.

JOHNSON BRONZE CO., New Castle, Pa.—Slide rule for finding over 800 stock sizes of general-purpose bearings. (Requests must be made on business letterhead.)

INGERSOLL-RAND, 11 Broadway, New York.—Bulletin 3070, gas-engine compressors for repressuring, recycling, pipe-line service, and natural-gasoline plants.

New Principle Is Incorporated in Allis Ajusto-Spede Motor

Louis Allis Co., Milwaukee, Wis., states its Ajusto-Spede motor not only introduces a new principle in alternating-current adjustable-speed motors, but incorporates advantages and economies heretofore not available in a.c. adjustable-speed units.

The Ajusto-Spede motor is a combination of an eddy-current clutch and a standard constant-speed a.c. squirrel-cage motor. There is no mechanical contact between the driving and driven members of the unit. The speed and torque variations are obtained by controlling the magnetic excitation of the clutch, thereby obtaining any desired slip.

Gradual or quick acceleration of load, rapid intermittent starting and disconnecting load, and absorbing of torsional impulses and vibrations are said to be effected without jar, shock or stress on any of the driven parts.

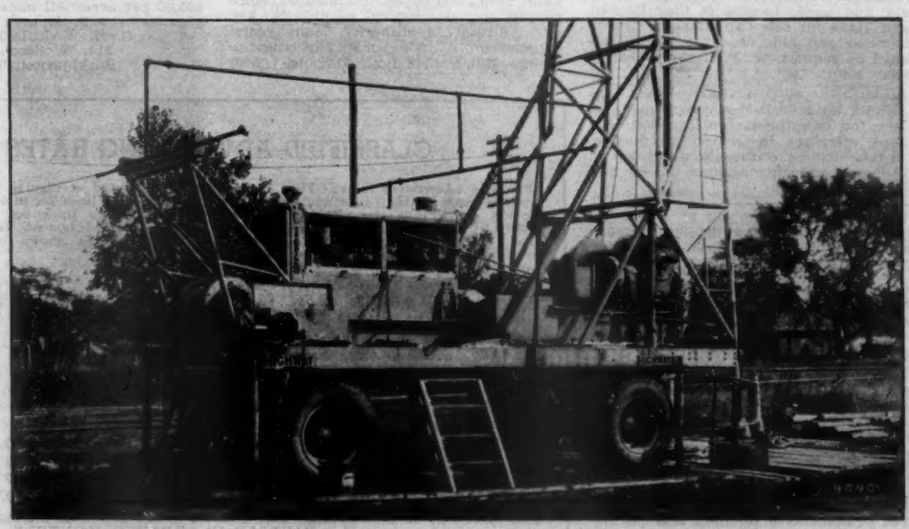
Features of the unit include an unusually wide range of speed variation from zero to full speed at full-load torque and continual operation at low speeds without overheating. Remote control is available as standard at slight extra cost. Uses for the unit are numerous; in fact, the field of application has not been fully ascertained.

Stillman Joins Consolidated

Lee P. Stillman, until recently with Moorlane Co., Tulsa, has joined the Consolidated Safety Valve Division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn., as sales engineer. Acting as chief engineer for Moorlane and sales engineer in charge of refining sales and sales to engineers and construction companies, Mr. Stillman is familiar with oil and gas relief-valve requirements. His experience covers several years with Cities Service Oil Co. in its East Chicago, Ind., refinery. His activities with Consolidated will cover the entire oil field.

HIGHWAY TRAILER DEVELOPS 3,000-FT. DRILLING RIG

Highway Trailer Co., Edgerton, Wis., has designed and developed the 3,000-ft. portable oil-well drilling machine, proved out in the Illinois field and demonstrating, according to the manufacturer, that the machine, as a whole, is capable of doing the work required of heavy-duty rotary rigs.



This compact drilling machine is thoroughly engineered for the work intended. It is easily transported to the job, quickly set up and easy to operate. Due to its ability to work in limited space, the first Highway machine was used on the Illinois Central right-of-way in Centralia, Ill., and it completed 10 holes to a depth of 1,500 ft. each in an average of 10 days per hole. It was the first machine to drill in hard Devonian lime in Illinois, completing five holes to a depth of more than 3,000 ft., averaging a hole complete in 21 days. A 3½-in. drill stem is used with the machine and in the hard Devonian-lime formation 20 Hughes bits were used per hole.

The Highway Trailer Co. has over 20 years' experience building earth-boring machines, hundreds of which are in operation throughout the world in public utility organizations. This experience accounts, in part, for the success of the Highway 3,000-ft. portable oil-well drilling rig. The company says it will announce in a short time a 6,000-ft. portable machine.

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LEASES—East Texas, La., South Ark., 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

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A complete SERVICE EXPERTS in every department of the Oil Business at your SERVICE a REAL SET-UP. The best opportunity ever offered you. Leases in large or small lots at
WHOLESALE PRICES
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200 Don Juan Bldg., Santa Fe, N. M.

SACRIFICE 40-acre Oil Lease, Chaves County, for only $10.00, full price. Guarantee title. P. O. Box 191, Clovis, N. Mex.

WILL they find oil in the Forest City Basin? Get the facts about 26 wells drilled this year. Particulars. Box 423, St. Joseph, Missouri.

CALIFORNIA Oil Land Surveys and Subdivisions. L. H. Gowdy, Licensed Surveyor and Civil Engineer. San Marino, Calif.

NEW MEXICO WEEKLY OIL SCOUT REPORT.—Send for sample copy. Roy G. Barton, Box 968, Hobbs, N. M.

WANT CAPITAL to invest in perpetual mineral rights in North Permian Basin in Texas and New Mexico in major company blocks on geophysical highs. Rapid development under way now. Will take interest after all monies have been repaid. Address Box J-990, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE Oil and gas leases and small production located in Kentucky shallow field, and leases located in Clay County, Tenn. Have for sale two tracts of proven Fluorspar and Zinc deposits; reports furnished on request. W. P. Harley, Bowling Green, Kentucky.

SHALE GAS PRODUCTION—EASTERN KANSAS. Have deals that commend themselves for investment consideration. Excellent offerings in proven gas leases. Will take drilling contract and develop or sell leases outright. Address P. O. Box 366, Paola, Kansas.

AN opportunity for you in a new oil field in Arizona. Good drilling proposition. 2320 E. McDowell, Phoenix, Arizona.

KENTUCKY AND INDIANA
Two wildcat blocks in Kentucky and Indiana. Drilling in Indiana, moving in Kentucky. Brokers write.
BURGER & SEIP
P. O. Box 426 Paducah, Kentucky.

MONTHLY INCOME FROM GAS
1/64th int. Four 40-acre offset leases. $200.00 Production 600 Ft. Four wells drilled complete upon sale three 1/8th ints. S.E.C. requirements filed, offering sheet, maps, upon request.
BOX 382
Osawatomie, Kansas.

BIG INCOME PRODUCING PROPERTIES, equipment in on lines and paying incomes. Shale gas production in Eastern Kansas. Will require $35,000 on one deal and about $10,000 on another. Brief outline submitted and if further interest, will submit all details. Address P. O. Box 366, Paola, Kansas.

2000 ACRE block of leases in Hardin County, Illinois, for McClosky test. 3000 acres in Pulaski County, Illinois, Want McClosky test. 800 acres Clay County, Illinois, want McClosky test. LEO H. GRAVES, Farina, Illinois.

Leases and Drilling Blocks

OIL LEASES, producing oil royalty, drilling blocks, and bargains in Texas ranch lands. Address—Licensed Trustee, Box 1203, Abilene, Texas.

EAST TEXAS Woodbine—Trinity sand wildcats starting shortly offer best chances big quick money, Leases—Royalties.
E. CROFT, PROCTOR, TEXAS.

NEW MEXICO
State Oil and Gas Leases
Buy on known structures where major companies own leases. 50c per acre. 5c rentals. Other leases as low as $6.00 per forty. Write for lists. Twenty years in the business without a complaint.
HARRY S. WRIGHT, STATE LESSEE
Registered Dealer—State of Iowa.
Box 166, Council Bluffs, Iowa
Box 347, Santa Fe, New Mexico

KENTUCKY OIL LEASES FOR SALE, $200 will buy one-half interest in 250 acres adjoining drilling well, Adair County, well now 300 feet. Can also furnish drilling blocks of from 1000 to 3000 acres at 20c. per acre, most of leases are 10 cent rentals. Wire or write, Frank Richardson, Columbia, Kentucky.

WILDCAT leases in southern Illinois. 50c acre up. Well going down.
BURGER OIL CO.
P. O. Box 426 Paducah, Kentucky.

MISSISSIPPI
SOUTH'S WONDER OIL STATE
600 acres ⅞ths form 88, 1 yr. free, 25c rentals, MONTGOMERY COUNTY, due east of Smackover. Two wells to drill and all acreage this county leased Oklahoma oil operators. Abstract furnished. $1200 cash. 4 sands here less than 3500 feet. Real opportunity. Box 648, Memphis, Tenn.

WILL sell 55 ac. leases of Sec. 27 and 14, Twp. 3n, Claremont Twp. of Richland County, Illinois. Chosen drilling site. G. Hedelin, East Rockford, Illinois.

WANTED — Geologist wants producing acreage for three corporations; rigid inspection must be expected. Arthur Nickell, Fayette, Missouri.

Survey Service

REMEMBER EAST TEXAS
When all other methods fail, employ my divining or dowsing method. If oil exists this methods finds it. Faults, broken, treacherous areas accurately defined. Our Watson #2, first producer Wilmington, Calif. field, located by this method. More reliable than mechanical geophysics. Ask any unbiased oil authority. Many years' experience. A wise man investigates. George Miller, 1548 Post, Torrance, Calif.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CHARTERS — Delaware best, quickest, cheapest, more liberal. Free forms. Colonial Charter Co., Wilmington, Del.

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Zingery Oil Map Co., Fort Worth, Tex

R. B. ROBINSON MAPS
Jackson, Miss. 312 Century Bldg.
Ownership maps of Yazoo and forty other Mississippi counties.

MISSISSIPPI MAP
Shows drilling tests, dry holes with elevations and total depths. Scale 1" = 8 miles. Size 26" x 48". Prices: Paper, $7.50—linen, $10.00.
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RANCHES and FARMS
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22,000 acres, most all smooth land, all minerals intact, over 16,000 acres improved. Terms, with $25,000 cash, balance carried at 4%. Price $3.25 per acre. If interested address C. O. Walling, 214 West Second St., Burkburnett, Texas.

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Valley Farm on Red River at Burkburnett, Texas. Good prospect for deep oil, good crop this year. 475 acres. Producing oil on part of this large tract. Will take $65.00 per acre. All minerals intact. Will give terms with ⅓ cash.
C. O. WALLING, Mgr.,
214 W. Second St.
Burkburnett, Texas.

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The Philtower
Tulsa, Oklahoma.

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Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

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CONSULTING GEOLOGISTS
Illinois-Indiana-Kentucky

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WILL buy unitized Diesel Rig, including derrick, drill pipe, casing, wire rope, etc., new or nearly so. For small-hole drilling to 7,000 feet, foreign. Send price per unit, total price, and price f.o.b., state which U. S. port. Send specifications and if will sell all or part. Address
BOX K-251
The Oil and Gas Journal
Tulsa, Oklahoma.

WANTED
Air Compressors
Ingersoll-Rand Belt Driven
10 & 4¼ x 10 XOB
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Tulsa, Oklahoma.

WANTED High Pressure Portable air compressor about 150 cu. ft. capacity good for 1,000 bbl. What have you? P. O. Box 592, Artesia, New Mexico.

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WANTED — Complete rigs, engines, pumps, drill pipe, draw works, derricks, tubing, rods, casing, line pipe, tanks. Must be in good condition and reasonable. Furnish complete description and price. Box K-324, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED—Portable core drilling rig, complete for 1200-ft. holes. Sutter Well Works, Pass Christian, Miss.

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Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

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THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

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COMPLETE 3,000 BBL. SKIMMING PLANT — RUSSELL, KANSAS

Foster-Wheeler Fractionating Column — 6'6"1Dx72' high. New Taylor Instruments throughout. Heat Exchangers, Hot Oil Pump Steam Engine Driven, Two Pipe Stills. 1 - 3" Tubes — 1 - 2½" Tubes.

WILL SELL ALL OR ANY PART

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Robt. W. Duden,
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Locomotives; all types
Relaying Rails
Freight Car Repair Parts
Perhaps *we* can supply your requirements, and *immediately?*
OTHER MACHINERY and EQUIPMENT, TOO!

IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Ave., Chicago, Ill.
"Anything containing IRON or STEEL"

STEAM DRILLING RIG
Unitized 3 speed — 2 shaft Oilwell 7" Drawworks.
2—New Lucey 104-HP 300# W.P. boilers.
1—18" Wilson-Snyder Steam pump.
1—12"x12" Gumbo Buster (Johnson) Engine.
1—New Lee C. Moore 122' drilling derrick. Rig complete with blocks, swivel, rotary table, derrick equipment and floor tools. Will sell for cash or credit memorandum from reputable supply company.
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1408 Magnolia Building
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FOR SALE: Approximately two thousand feet of 9⅝" O.D. 19.6 Lbs. per foot. Plain end, 40' random lengths Line Pipe in No. 1 condition. Arab Gasoline Corporation, Eastland, Texas.

FOR SALE: Reconditioned OCS Single Brake and Grayhound chain driven sand reels. I. T. I. O.. Bartlesville, Oklahoma.

PRICED FOR QUICK DISPOSAL
2—Complete modern power rigs.
No. 1—2-225 H. P., Le Roi Engines, 7¼" x 14" pump, 8" draw works, roller bearing blocks, 8" oil bath swivel, 27½" oil bath rotary, 4,000 ft. 4½" full hole drill pipe, all handling tools and supplementary equipment. Located near Nocona, Texas.
No. 2—Same as above with exception of 6" draw works, 6" swivel and 3,000 ft. of 4½" drill pipe. Located Oklahoma City.
LUCEY PRODUCTS CORP.
Tulsa, Oklahoma.

IF YOU buy or sell royalties, leases or production, DON'T FAIL to check each item listed in these classified columns They comprise the best medium of exchange available to you.

Classified Department.

COMPLETE PIPE YARD—WESTERN KANSAS. 2" 12½" 18" Bignall Keeler Pipe Machines, Westinghouse 350 Ampere Welder Truck trailer all Inventory at very low price. Address 553 North Fountain, Wichita, Kansas.

RECONDITIONED 2½" to 12½" Landis Motor Driven Pipe Threading Machine, and extra head. Located Tulsa, reasonable. Address Box K-330, The Oil and Gas Journal, Tulsa, Oklahoma.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St. Cincinnati, Ohio.

FOR SALE

25,000 Ft. of 2" Pipe
10,000 Ft. of 2½"
35,000 Ft. of 3"
20,000 Ft. of 4"
10,000 Ft. of 6"
10,000 Ft. of 8", all threaded and collared line pipe strictly No. 1, located in Shreveport, Louisiana.
We also have 30,000 Ft. of 6" screw line Pipe in Oklahoma and 10,000 Ft. of 8" in Missouri.
Wire, Write or Phone for Prices.

Louisiana Iron & Supply Co.
Shreveport, Louisiana

HAVE Purchased Phillips Petroleum Company Maud, Okla., Warehouse FOR IMMEDIATE SALE AT BARGAIN PRICES. Entire Warehouse Buildings and stock, consisting of Electrical and all types of oilfield material and equipment, both used and new.
MORAN PIPE & SUPPLY COMPANY
Phone 566, Seminole. Phone 165, Maud.

WE OFFER—STEEL DERRICKS
Fresh Painted—Excellent condition.
We still have a few left.
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TRACTORS
Government crawler type Caterpillars, 5 ton $375, 10 ton $695, Slightly used. Perfect condition.
O. C. EVANS
Mt. Sterling, Ky.

DISTILLATE HEATING STOVES
For steel oil field (doghouses) with lifetime Glebe Burner. Weld to floor, permanent, efficient, economical. $26.50 F.O.B. Rankin. Chas. E. Glebe, Rankin, Texas.

COMPRESSOR CYLINDERS AND GAS ENGINES 6", 7¼", 7½", 12", 17", 17½", 18" and 26" Clark, Bessemer, Ingersoll-Rand Compressor Cylinders. 40 HP 2-cycle Superior Gas Engines complete. Reversible Clutches and extra parts. All reshopped and in first class condition.
NOLAN SALES CORPORATION
Tulsa, Okla. Seminole, Okla.

FOR SALE—1,400 ft. 13⅜" Seamless Casing, Range 2, guaranteed to be in first class condition. Price $1.75 ft. F.O.B. Ellinwood, Kansas. Jay Kornfeld, 414 Brown Building, Wichita, Kansas.

EQUIPMENT FOR SALE
2—Used Full Electric Diesel Powered Drilling Rigs—complete with Drill Pipe.
1—Used Electric-Mechanical Diesel Powered Drilling Rig—Less Drill Pipe.
1—Used Complete Large Steam Drilling Rig.
All in first class condition. For inventory and Prices call or write
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and
YARHOLA GASOLINE PLANT
Drumright, Oklahoma

Storage Tanks
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Absorbers, Condensers
Towers, Regulators
Electric Motors
Prefabricated buildings
Industrial light plant
Pipe—Valves—Fittings

Write for Catalog

BROWN - STRAUSS CORPORATION
Main Plant and Office:
1446 Guinotte
Kansas City, Mo.

Office at
Shell Refinery Site
Arkansas City, Kansas

FOR SALE—122' Emsco Drilling Derrick with substructure. Practically new.
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Henderson, Texas.

Financing

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD. Fox Theater Building, Detroit, Michigan

CORPORATE ORGANIZING and FINANCING—RE-ORGANIZATIONS
Brown Hartwell Company
110 East 42nd Street
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180 RECENT underwriters of smaller security issues $4. Valuable bulletin FREE with order. JOHN MORRIS, Box 5411, Philadelphia, Pennsylvania.

Mailing Lists

ROYALTY Lists. Oil Investor Lists. Stockholders Lists. By states. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Oklahoma.

Situations Wanted

Oil and Gasoline Distributing Companies! Corporate real estate, taxation, chain leasing man; specialist property tax assessment reduction; appraisal; successful tax saving record in present position greatly exceeding salary remuneration. Address Box K-262, The Oil and Gas Journal, Tulsa, Oklahoma.

MANUFACTURERS REPRESENTATIVE
An experienced and well acquainted salesman desires additional lines to sell, in Mid-Continent Area. Commission or Salary. Box K-291, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY ENGINEER—12 years' experience in oil refinery drafting, estimating, cost control and field work. Last 8 years with one major company holding responsible position. College graduate. Address Box K-310, The Oil and Gas Journal, Tulsa, Oklahoma.

INVESTIGATOR

LAWYER ACCOUNTANT

Five years with Division of Investigation, Department of the Interior. Thoroughly familiar with Government restrictions, regulations, tender-boards, etc., wants to become connected with oil company. Salary of secondary importance, mainly interested in future. Single, will go anywhere. Box K-336, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL SPECIALIST tax consultant. Age 37. C.P.A. 14 yrs. experience, which includes systematizing, financial reports, and diversified public accounting. Highest credentials as to integrity and creative ability. Address Box K-130, The Oil and Gas Journal, Tulsa, Okla.

PETROLEUM ENGINEER—Young man, production and drilling experience on Gulf Coast. P.P.E. degree from the University of Texas. Desires position anywhere that will involve land department work along with drilling and production. Address Box K-311, The Oil and Gas Journal, Tulsa, Oklahoma.

ACCOUNTING SERVICE, monthly operating and financial reports, etc. prepared for oil operators whose volume of work does not warrant employment of full time accountant. Houston and vicinity. Address Box K-331, The Oil and Gas Journal, Tulsa, Oklahoma.

Graduate B.S. in mining and geology with experience in surveying, mapping, and drilling wants connection with an active organization in the development of raw material sources. Married. Will go anywhere in the U.S.A. or Canada. Compensation secondary to opportunity. Address Box K-332, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY Chemist with a Master's Degree and 11 years' experience in petroleum refinery laboratory control in modern refineries. Good references. Address Box K-333, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL Accountant. Experience—development—production—refining. Excellent references. Address Box K-334, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE mining engineer, with 30 years' experience in drainage, highway, municipal, subdivision development, and land surveying. Address Box K-335, The Oil and Gas Journal, Tulsa, Oklahoma.

LAWYER—3 years experience. Some commercial, corporation and tax law experience. Some selling, journalism and business experience. Want good job requiring administrative and legal ability. Willing to work for it. Box K-337, The Oil and Gas Journal, Tulsa, Oklahoma.

Gulf Coast Markets

(Continued from Page 185)

Gulf Coast, the increase is taken as indicative of trends, which are not regarded as favorable for maintenance of a satisfactory market position unless a substantial volume of new business is forthcoming shortly.

Aviation gasoline supplies are limited and this market continues firm. Refiners are trying to build up stocks, saying they cannot have too much of this product on hand, since it is expected to be first on call if war demand develops. Sellers are quoting a nominal price of 8¼ cents for export.

A week ago it was reported kerosenes, diesel and fuel oils were a little easier, but apparently any material that was available at that time has been taken up, as there is little of any of these products to be had now. Sellers are unwilling to commit themselves on the future, expecting further increased demand, both from domestic sources and from war needs.

Contracted lubricating oils are being moved out rapidly in expectation of higher prices after this month. These movements are leaving little material for spot sales, and quotations are made on a take-it-or-leave-it basis.

Stephens County Opener

FORT WORTH, Tex.—Stephens County's newest pool opener, T. G. Shaw, trustee's No. 1 S. P. Stroud, Monday was swabbing 10 to 12 bbl. of 41-42-gravity oil hourly. It topped the Kisenger sand at 2,597 ft., total depth 2,602 ft.

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Williams & Co., J. H. 68
Wilson Manufacturing Co.
Wisconsin Motor Corporation ... 167
Witte Engine Works 61
Woodworth Hotel 147
Worthington Pump & Machinery Corporation 23
Wyatt Metal & Boiler Works

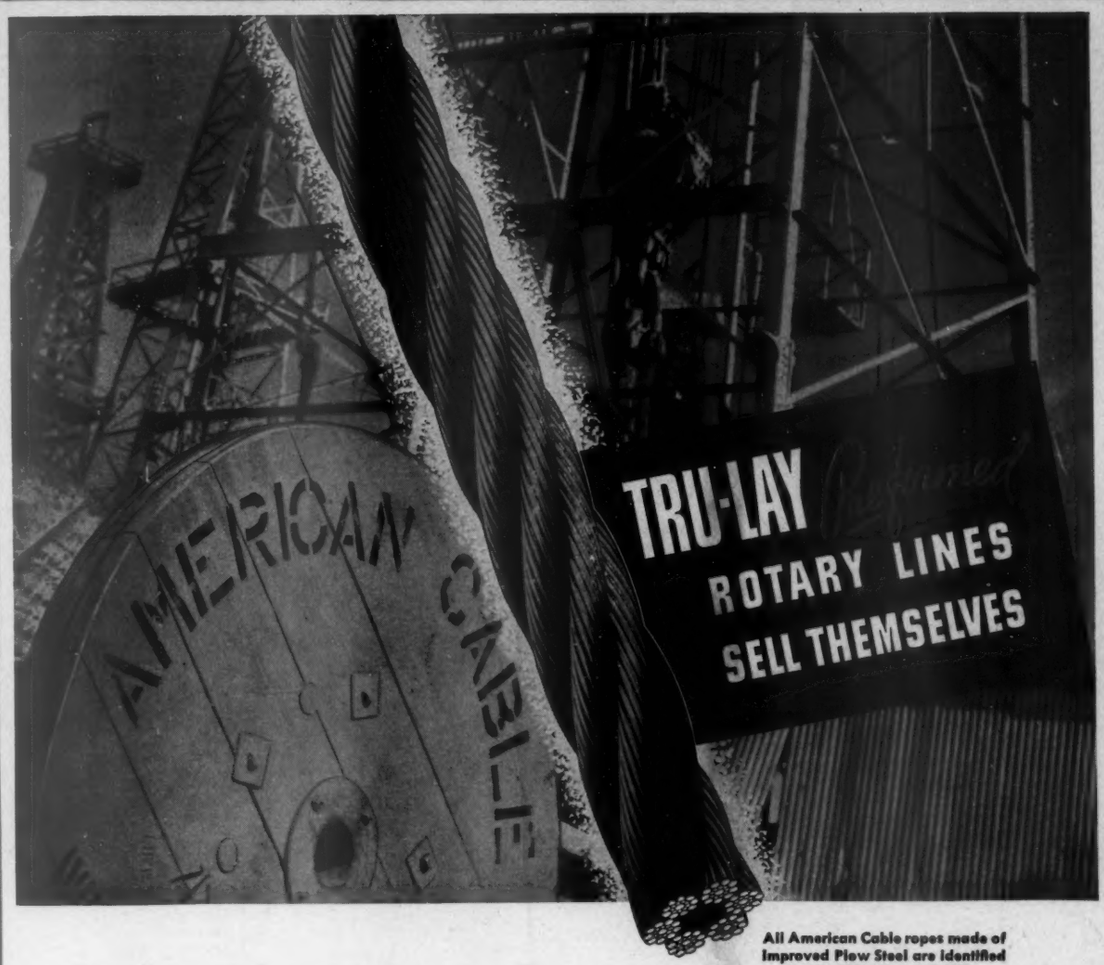
Y

Young Engine Corp. 106
Youngstown Sheet & Tube Co.

Z

Zink Burners, John

The Oil Man's Calendar appears on Page 46



All American Cable ropes made of Improved Plow Steel are identified by the EMERALD STRAND

Once a driller uses a TRU-LAY Preformed Rotary Line on our recommendation, we very rarely lose his future patronage. And this isn't due to salesmanship. It is due to the sheer superiority of TRU-LAY.

TRU-LAY Preformed Rotary Lines are much easier and faster to string. They spool better. They whip less at high speeds. They resist kinking. They reduce the non-productive "round-trip" time. They last longer.

Specify TRU-LAY Preformed for your next line. Learn, on your own rig, the real dollar value of this preformed rope. This line is always relaxed because it's preformed.

BUY ACCO QUALITY *whether for American Cable wire Lines—American Welded and Weldless Chain—Ford Chain Blocks—Page Chain Link Fence—Page Welding Wire—Reading-Pratt & Cady Valves, or any of the other 137 ACCO Quality Products.*

Write today for this free booklet. You'll find it both constructive and helpful.

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WILKES-BARRE, PENNSYLVANIA

BRANCHES OR DISTRIBUTORS IN ALL OIL FIELD CENTERS

AMERICAN CHAIN DIVISION • AMERICAN CABLE DIVISION • ANDREW C. CAMPBELL DIVISION • FORD CHAIN BLOCK DIVISION • HAZARD WIRE ROPE DIVISION • HIGHLAND IRON AND STEEL DIVISION • MANLEY MANUFACTURING DIVISION • OWEN SILENT SPRING COMPANY, INC. • PAGE STEEL AND WIRE DIVISION • READING-PRATT & CADY DIVISION • READING STEEL CASTING DIVISION • WRIGHT MANUFACTURING DIVISION • IN CANADA: DOMINION CHAIN COMPANY, LTD. • IN ENGLAND: BRITISH WIRE PRODUCTS, LTD. • THE PARSONS CHAIN COMPANY, LTD. • *In Business for Your Safety*

There's more cutting surface on a HUGHES ROCK BIT

CHECK ON THIS !

Keep a HUGHES ROCK BIT "On Bottom" and Save Expensive Round Trips!

HUGHES TOOL COMPANY - HOUSTON, TEXAS, U. S. A.

The Oil and Gas Journal's
ILLINOIS BASIN MAP

Refineries in the Illinois Basin Area

ILLINOIS

Map key number	Company—	Plant location	Capacity (bbl. daily)
1.	Standard of Indiana	Wood River	20,300
2.	Shell Oil Co., Inc.	Wood River	85,000
3.	Socony-Vacuum Oil Co., Inc.	East St. Louis	20,000
4.	H. H. Cross Co., Inc.	Dupo	1,000
5.	Mathews Refining Co.	St. Louis, Mo.	3,500
6.	Advance Refining Co., Inc.	Centralia	2,000
7.	Centralia Refining Co., Inc.	Centralia	2,000
8.	Egyptian Prod. & Ref. Co.	Centralia	2,500
9.	Basin Oil Refining Co.	Centralia	2,000
10.	Art Goodson Refining Co.	Sandoval	1,000
11.	Wabash Refining Co.	Sandoval	1,000
12.	Cascade Refining Co.	Salem	3,000
13.	Pana Refining Co.	Pana	1,750
14.	Allied Oil Corp. of Illinois	St. Elmo	4,000
15.	Northern Refining Co.	St. Elmo	750
16.	Ohio Oil Co.	Robinson	10,000
17.	Indian Refining Co.	Lawrenceville	18,000
18.	Fairfield Refining Co.	Merriam	2,000
22.	Central Illinois Oil & Ref. Co.	Central City	2,000
23.	H. S. & B. Refining Co.	Mill Shoals	1,200

INDIANA

Map key number	Company—	Plant location	Capacity (bbl. daily)
19.	Troy Refining Corp.	Troy	250
20.	Evansville Refining Co., Inc.	Evansville	2,000

KENTUCKY

Map key number	Company—	Plant location	Capacity (bbl. daily)
21.	Tri-States Refineries, Inc.	Spottsville	800

New Oil and Gas Fields

ILLINOIS
1938 DISCOVERIES

Field and county—	S.-T.-R.	Map key	Production formation	Depth (ft.)
Barnhill, Wayne	27-2s-9e	N-17	McClosky	3,386-3,409
Calvin, White	32-3s-14w	P-18	McClosky	3,016-3,032
Cravat, Jefferson	14-6s-5e	I-16	Bethel	2,065-2,084
Cordes, Washington	14-3s-3w	G-17	Bethel	1,228-1,239
Dundas, Richland	56-5n-9e	O-12	McClosky	2,830-2,930
Enterprise	3-1n-8e	N-15	McClosky	3,087-3,100
Grayville, Edwards	18-3s-11e	P-17	McClosky	3,096-3,269
Golden Gate, Wayne	30-2s-9e	O-17	McClosky	3,432-3,441
Griffin, Wabash	19-2s-13w	Q-17	Bisht	1,713-1,719
Iona, Clay	17-5n-5e	I-13	Aux Vases	2,356-2,383
Junction, Gallatin	17-8s-9e	O-P	Waltersburg	1,757-1,784
Marcoe, Jefferson	3s-2e	J-17	McClosky	2,746
Mill Shoals, White	31-3s-8e	N-18	McClosky	3,360-3,405
Mount Carmel, Wabash	13-1s-13w	R-18	Tar Springs	1,940
			Cypress	2,556
Mount Erie, Wayne		O-16	McClosky	3,092
New Harmony, White	18-5s-14w	P-19	McClosky	2,998-3,017
Springerton, White	6-4s-9e	N-18	Aux Vases	3,235-3,282
Stewardson, Shelby	27-10n-5e	L-9	Aux Vases	1,942-1,969
Storms, White (gas)	14-6s-9e	O-S	McClosky	2,984-3,079
Tonti, Marion	33-3n-2e	J-14	McClosky	2,160-2,193
Whittington, Franklin	19-5s-3e	K-19	McClosky	2,869

REVIVED IN 1939

Sorento, Bond	6n-4w	F-11	Devonian	1,800

1938 DISCOVERIES

Aden, Wayne	18-3n-8e	M17	McClosky	3,276-3,284
Aden, North, Wayne	4-2s-7e	M17	McClosky	3,309-3,325
Boyleston, Wayne	4-2s-7e	N-16	McClosky	3,253
Dix, Jefferson	9-1s-2e	I-16	Bethel	1,950
Elk Prairie, Jefferson	16-4s-2e	I-16	McClosky	2,745-2,751
Flora, Clay	13-3n-6e	N-13	McClosky	2,971-2,975
Ina, Jefferson	25-4s-2e	I-16	McClosky	3,002-3,007
Leech, Wayne	16-3s-9e	O-17	McClosky	3,420-3,438
Olson, Clay	12-2n-7e	N-14	McClosky	3,060-3,065
Roaches, Jefferson	28-2s-1e	I-17	Rosi Clair	2,102
			McClosky	2,255
Olney, South, Richland	10-3n-10e	P-14	McClosky	3,070
St. James, Fayette	30-6n-3e	J, K-12	Cypress	1,589-1,632
Salem, Marion	5-1n-2e	J-14, 15	McClosky	2,000
			Aux Vases	1,801
			Bethel	1,786
Sandoval, Marion	8-2n-1e	I-14	Devonian	2,920-2,926
			Benoist (old)	1,500
Schnell, Richland	7-2n-9e	O-14	McClosky	2,963-2,981

1937 DISCOVERIES

Centralia, Clinton and Marion	1, 2n-1w-1e	I-15	Benoist	1,355
			Cypress	1,200
Cisne, Wayne	28-1n-7e	N-15	McClosky	2,117
			Aux Vases	2,982
Clay City, Clay and Mayne	33-3n-8e	N-14	McClosky	2,984
			Cypress	2,813
Louden, Fayette	7-8n-2, 3e	J, K-10, 11	Bethel	1,542
			Paint Creek	1,542
			Cypress	1,510
Noble, Richland	8-3n-9e	O-13, 14	McClosky	2,961-2,990
Noble, North, Richland	28-4n-9e	O-13	McClosky	3,000
Olney, Richland	22-4n-10e	P-13	McClosky	3,000
Patoka, Marion	28-4n-1e	I-13	Bethel	1,424
Rinard, Wayne	33-2n-7e	M-15	McClosky	2,140

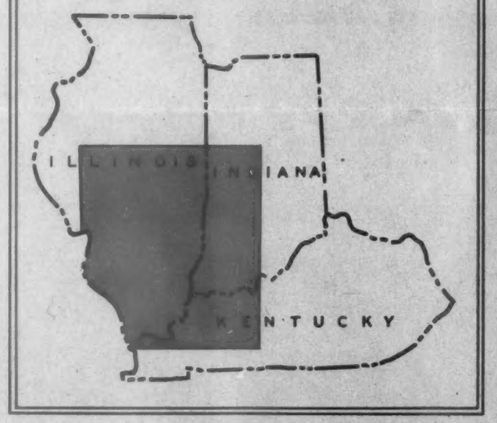
INDIANA
DISCOVERIES 1938 TO DATE

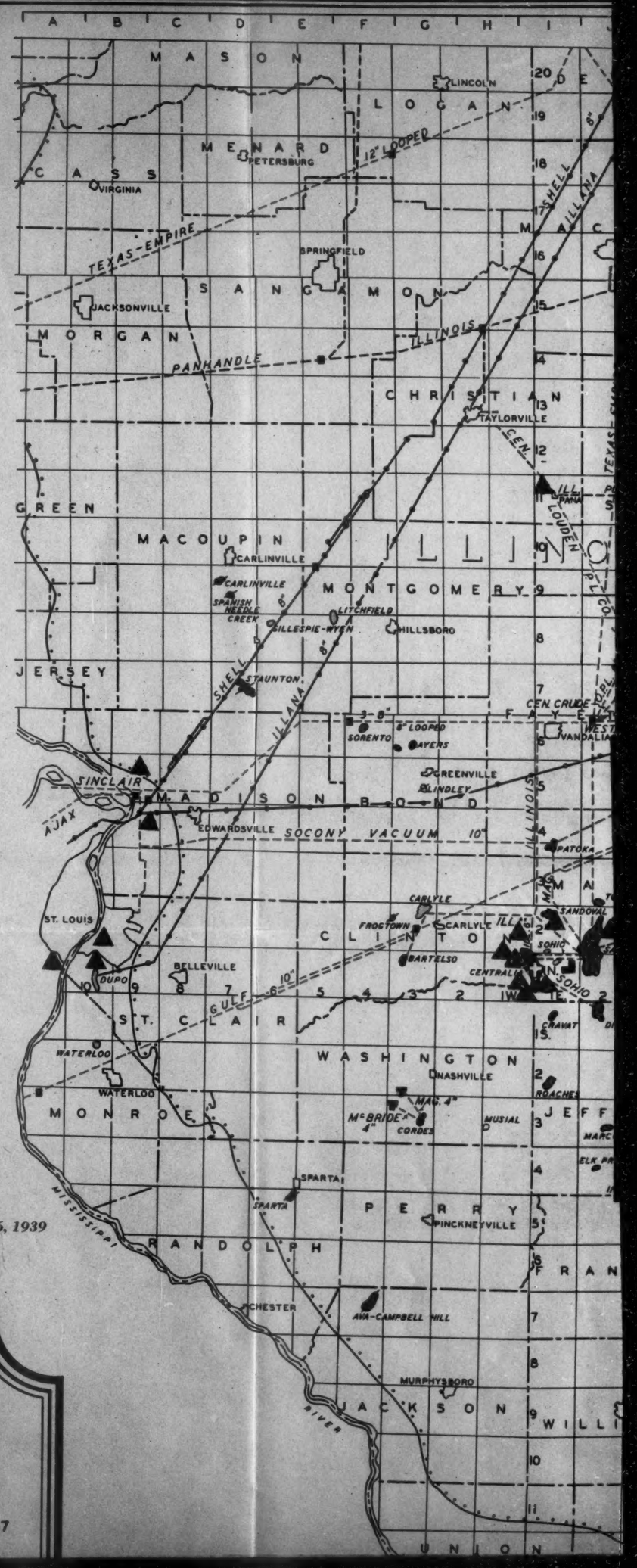
Walker	13-3s-9w	U-17	McClosky	1,521-1,528
Griffin, Gibson	13-3s-14w	Q-17	McClosky	2,963-2,920
			Cypress	

KENTUCKY
DISCOVERIES 1938 TO DATE

Field and county—	Carter coordinate	Producing formation	Depth (ft.)
Bolton, Muhlenburg	21-I-30	McClosky	1,521-1,528
Birk City, Henderson and Daviess	P-27	McClosky	
Breslin, Butler	17, 24, 18-H-32	Tar Springs sand	
Cane Run, Daviess	3-N-31	Tett sand	859-879

Map Covers Shaded Area





Supplement to The Oil and Gas Journal, Issue of October 26, 1939

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LEGEND

- NEW OIL FIELD - LIME
- NEW OIL FIELD - SAND
- NEW OIL FIELD - LIME & SAND
- OLD OIL FIELD
- GAS FIELD
- FIELD ABANDONED PRIOR TO 1937
- --- OIL PIPE LINE

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IOR TO 1937

ILLINOIS

INDIANA

Refineries in the Illinois Basin Area

ILLINOIS

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6.	Advance Refining Co., Inc.	Centralia	2,000
7.	Centralia Refining Co., Inc.	Centralia	2,000
8.	Egyptian Prod. & Ref. Co.	Centralia	2,500
9.	Basin Oil Refining Co.	Centralia	2,000
10.	Art Goodson Refining Co.	Sandoval	1,000
11.	Wabash Refining Co.	Sandoval	1,000
12.	Cascade Refining Co.	Salem	3,000
13.	Pana Refining Co.	Pana	1,750
14.	Allied Oil Corp. of Illinois	St. Elmo	4,000
15.	Northern Refining Co.	St. Elmo	750
16.	Ohio Oil Co.	Robinson	10,000
17.	Indian Refining Co.	Lawrenceville	18,000
18.	Fairfield Refining Co.	Merriam	2,000
22.	Central Illinois Oil & Ref. Co.	Central City	2,000
23.	H. S. & B. Refining Co.	Mill Shoals	1,200

INDIANA

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20.	Evansville Refining Co., Inc.	Evansville	2,000

KENTUCKY

21.	Tri-States Refineries, Inc.	Spottsville	800

New Oil and Gas Fields

ILLINOIS

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Cordes, Washington	14-3s-3w	G-17	Bethel	1,228-1,239
Dundas, Richland	56-5n-9e	O-12	McClosky	2,830-2,930
Enterprise	3-1n-8e	N-15	McClosky	3,087-3,100
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Golden Gate, Wayne	30-2s-9e	O-17	McClosky	3,432-3,441
Griffin, Wabash	19-2s-13w	Q-17	Biehl	1,713-1,719
Iona, Clay	17-5n-5e	I-12	Aux Vases	2,356-2,383
Junction, Gallatin	17-9s-9e	O-P	Walterburg	1,757-1,794
Marcoe, Jefferson	3s-2e	J-17	McClosky	2,746
Mill Shoals, White	31-3s-8e	N-18	McClosky	3,360-3,405
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			Cypress	2,556
Mount Erie, Wayne		O-16	McClosky	3,092
New Harmony, White	18-5s-14w	P-19	McClosky	2,988-3,017
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Roaches, Jefferson	28-2s-1e	I-17	Rosi Clair	2,192
			McClosky	2,255
Olney, South, Richland	10-3n-10e	P-14	McClosky	3,070
St. James, Fayette	30-6n-3e	J, K-12	Cypress	1,569-1,622
Salem, Marion	5-1n-3e	J-14, 15	McClosky	2,000
			Aux Vases	1,801
			Bethel	1,766
Sandoval, Marion	8-2n-1e	I-14	Devonian	2,920-2,926
			Benoist (old)	1,500
Schnell, Richland	7-2n-9e	O-14	McClosky	2,963-2,981

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			Cypress	1,200
Clone, Wayne	26-1n-7e	N-15	McClosky	3,117
			Aux Vases	2,982
Clay City, Clay and Wayne	33-3n-8e	N-14	McClosky	2,994
			Cypress	2,813
Louden, Fayette	7-8n-2, 3e	J, K-10, 11	Bethel	1,542
			Paint Creek	1,542
			Cypress	1,510
Noble, Richland	8-3n-9e	O-13, 14	McClosky	2,961-2,990
Noble, North, Richland	26-4n-9e	O-13	McClosky	3,000
Olney, Richland	22-4n-10e	P-13	McClosky	3,000
Patoka, Marion	29-4n-1e	I-13	Bethel	1,424
Rinard, Wayne	33-2n-7e	N-15	McClosky	3,140

INDIANA

DISCOVERIES 1938 TO DATE

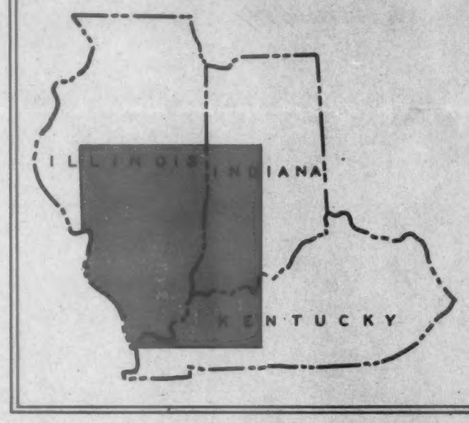
Walker	13-3s-9w	U-17	McClosky	1,521-1,528
Griffin, Gibson	13-3s-14w	Q-17	McClosky	2,863-2,920
			Cypress	

KENTUCKY

DISCOVERIES 1938 TO DATE

Field and county—	Carter coordinate	Producing formation	Depth (ft.)
Belton, Muhlenburg	21-I-30	McClosky	1,521-1,528
Birk City, Henderson and Daviess	P-27	McClosky	
Breslin, Butler	17, 24, 18-H-32	Tar Springs sand	
Cane Run, Daviess	5-N-31	Jett sand	659-679
		McClosky	
Corydon, Henderson	18-P-22	McClosky	
Gilmore, Henderson and Daviess	25-P-27	McClosky	
Glenville, Daviess	11-N-28	Chester sand	
Harper, Butler	19-H-32	Tar Springs sand	
Huntsville, Butler	6-N-32	Tar Springs sand	
Livermore, McLean	6-L-29	Tar Springs sand	1,138-1,153
		Bethel (gas)	1,392-1,407
		McClosky	1,617-1,632
Nants, Daviess	1-Q-30	Jett sand	
Oklahoma, Ohio	6-N-32	Jett sand	508-519
		Tar Springs sand	
Reed, Henderson	11-Q-28	McClosky	
Rochester, Butler	13-I-32	Tar Springs sand	
Sebree, Webster	22-N-34	McClosky	
Silver City, Butler	7-H-33	Jones sand	483-510
		Hardinsburg	
Spottsville, Henderson	22-Q-25	McClosky	2,173-2,184
Tarustos, Daviess	9-P-30	McClosky	1,448-1,450
Utica, Daviess	13, 18, 24-N-28	McClosky	

Map Covers Shaded Area



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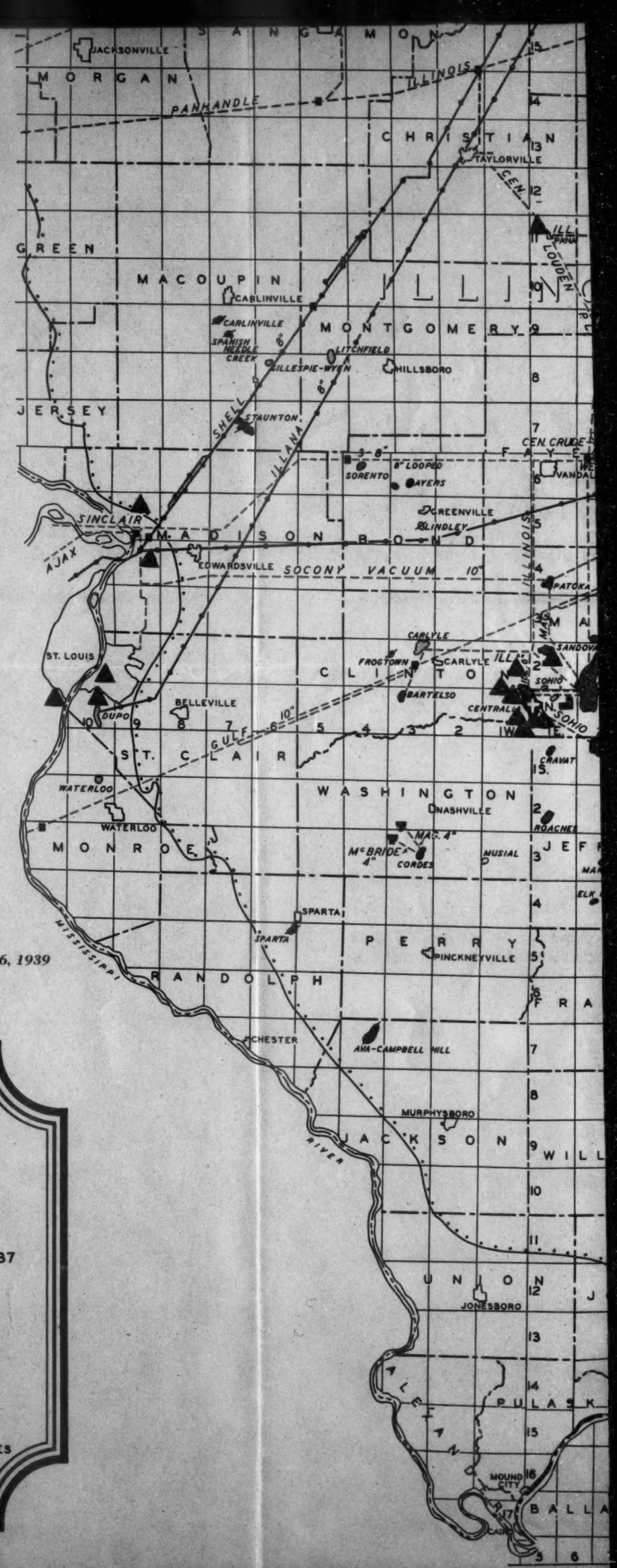

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The Oil and Gas Journal's

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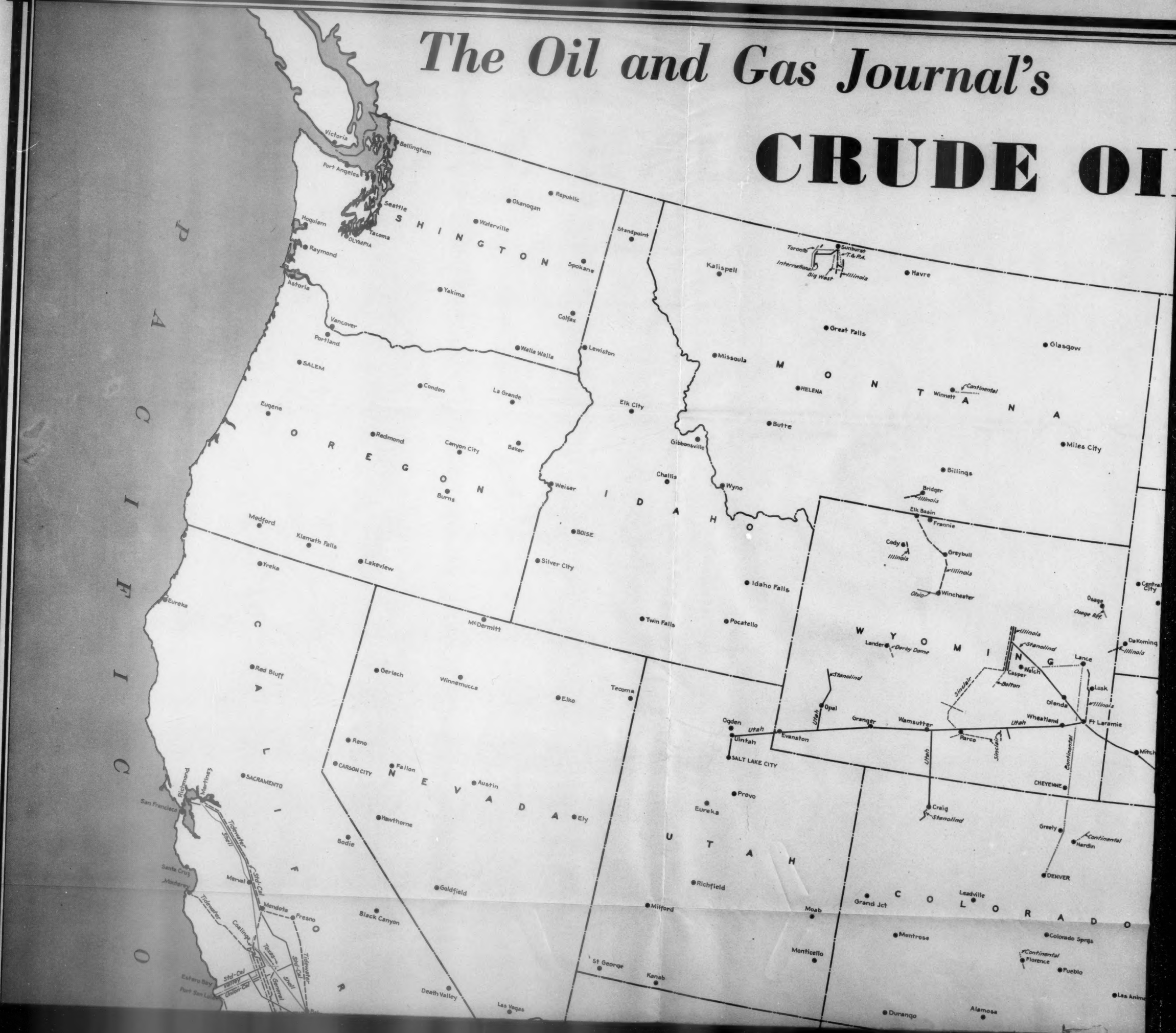

OIL *and* GASOLINE PIPE LINE

LEGEND
RED —— GASOLINE PIPE LINES
BLUE —— CRUDE OIL PIPE LINES
ORANGE — CRUDE OIL PIPE LINES
25 0 25 50 75 100 150
SCALE
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ERIE
LAKE ONTARIO
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
WISCONSIN
IOWA
NEBRASKA
KANSAS
MISSOURI
ILLINOIS
INDIANA
OHIO
KENTUCKY
Sultan
Minot
Grand Forks
Bemidji
Virginia
Duluth
Ashland
Iron Wood
Calumet
Marquette
Sault Ste. Marie
Escanaba
Cheboygan
Alpena
Rhinnelander
Rice Lake
Marinette
Eau Claire
Minneapolis
ST PAUL
Lakeville
Grand Rapids
Aberdeen
Dupree
Pierre
Huron
Mitchell
Luverne
Austin
La Crosse
Sioux Falls
Mason City
Madison
Yankton
Sioux City
Waterloo
Ft Dodge
Cedar Rapids
Coralville
Clinton
Omaha
Council Bluffs
Des Moines
Osceola
Fairfield
Keokuk
Lincoln
Norfolk
Seneca
North Platte
Keystone
Beck
Alfalfa Center
Superior
Deshler
Washington
St Joseph
Eudora
Topeka
Kansas City
Paola
Centralia
Jefferson City
Springfield
Center
Moscow
Mattoon
Effingham
Terre Haute
Indianapolis
Bloomington
Lafayette
Logansport
Keyworth
Dublin
Cincinnati
Madison
Louisville
Frankfort
Lebanon
Somerset
Owensboro
Evansville
Vincennes
Lawrenceville
Stoy
Salem
Noble
Centralia
Fairfield
Valmeyer
Steelville
Cuba
Phillipsburg
Colby
Zurich
Fairport
Gorham
Stoltenberg
Hudson
Elyria
Cunningham
Dodge City
Scott City
Las Animas
Pueblo
Colorado Springs
Lance
Lusk
Chadron
Ft Laramie
Oshkosh
Keystone
Hardin
Osage
Rapid City
Central City
Deadwood
Douglas
Casper
Billings
Sheridan
Gillette
Newcastle
Lovell
Cody
Worland
Thermopolis
Greybull
Basin
Powell
Frannie
Kirby
Shoshoni
Riverton
Lander
Fort Washakie
Rock Springs
Green River
Evanston
Kemmerer
Cokeville
Afton
Jackson
Pinedale
Big Piney
Marbleface
Opal
Kemmerer
Diamondville
Mountain View
Lyman
Granger
Ft Bridger
Carter
Manila
Vernal
Roosevelt
Duchesne
Price
Helper
Wellington
Green River
Thompson
Grand Junction
Rangely
Meeker
Craig
Hayden
Steamboat Springs
Kremmling
Granby
Hot Sulphur Springs
Grand Lake
Fraser
Winter Park
Idaho Springs
Georgetown
Central City
Golden
Denver
Boulder
Longmont
Loveland
Fort Collins
Greeley
Brighton
Fort Morgan
Sterling
Julesburg
Akron
Wray
Yuma
Burlington
Limon
Hugo
Kit Carson
Eads
Lamar
Las Animas
Trinidad
La Junta
Rocky Ford
Swink
Manzanola
Fowler
Ordway
Crowley
Olney Springs
Pueblo
Florence
Canon City
Salida
Buena Vista
Leadville
Glenwood Springs
Aspen
Carbondale
Rifle
Grand Junction
Delta
Montrose
Ouray
Silverton
Durango
Cortez
Dolores
Telluride
Gunnison
Crested Butte
Monarch

INE PIPE LINE MAP

LEGEND

RED —— GASOLINE PIPE LINES
BLUE —— CRUDE OIL PIPE LINES
ORANGE — CRUDE OIL PIPE LINES

25 0 25 50 75 100 150 200 MILES
SCALE

MAJOR PIPE LINE SYSTEMS

CRUDE OIL

Company—	Miles of Trunk Lines
Ajax Pipe Line Corporation	798
American Liberty Pipe Line Company	190
Arkana Transit Corporation	32
Arkansas Fuel Oil Company	162
Arkansas Pipeline Corporation	91
Atlantic Pipe Line Company	966
Atlas Pipeline Corporation	151
Barnsdall Pipe Line Company	75
Barnsdall Refining Corporation	80

Reno
CARSON CITY
Fallon
Austin
Ely
Hawthorne
Bodie
Goldfield
Black Canyon
Death Valley
Las Vegas
Ogden
Utah
Uintah
Evanston
SALT LAKE CITY
Provo
Eureka
Richfield
Milford
Moab
Monticello
St George
Kanab
Grand Jct
Craig
Stanolind
Parco
Greely
Hardin
DENVER
Leadville
Montrose
Colorado Spgs
Florence
Pueblo
Las Animas
Durango
Alamosa
Trinidad
Farmington
Raton
Gallup
SANTA FE
Albuquerque
Socorro
Roswell
Artesia
Monument
Hobbs
Tucson
Silver City
Bisbee
El Paso
Wink
Pecos
McCamey
Grand Canyon
Toreva
Nelson
Williams
Flagstaff
Needles
Yucca
Rice
PHOENIX
Yuma
Ocean Beach
San Diego
Huntington Beach
Los Angeles
Santa Barbara
Ventura
Lebec
Mojave
Bakersfield
Maricopa
Coalinga
Fresno
Mendota
Merval
Santa Cruz
Monterey
Estero Bay
Port San Luis
Port Petrol
Gaviota
Richmond
Martinez
San Francisco
SACRAMENTO
Shell
Tidewater
Std-Cal
Valley
Union-Cal
General
Texas
Fairfield
Petrol
Continental
Texas-N.M.
Monument
Humble
Cities
Sinclair
Wtexas Nat'l
Stanolind
CALIFORNIA
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
MEXICO

NEBRASKA
IOWA
KANSAS
MISSOURI
ILLINOIS
INDIANA
OHIO
KENTUCKY
WEST VIRGINIA
OKLAHOMA
TEXAS
ARKANSAS
LOUISIANA
MISSISSIPPI
ALABAMA
GEORGIA
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
FLORIDA
GULF OF MEXICO
Mitchell
Seneca
Norfolk
Cedar Rapids
Coralville
Clinton
Griffith
South Bend
Oshkosh
North Platte
Omaha
Council Bluffs
DES MOINES
Lamont
Keystone
Beck
Alfalfa Center
Oscesola
Fairfield
LINCOLN
Hardin
Superior
Deshler
Washington
St Joseph
Kahoka
Heyworth
Bluffton
Findlay
Fostoria
Lima
Canton
Logansport
LaFayette
Springfield
COLUMBUS
Heath
Morgantown
Downs
Parkersburg
Elm Run
Dublin
INDIANAPOLIS
Terre Haute
Bloomington
Cincinnati
Laconia
Colby
Eudora
TOPEKA
Kansas City
Center
Mattoon
Zurich
Fairport
Gorham
Stoy
Lawrenceville
Madison
Falling Rock
CHARLESTON
Cabin Cr
Staunton
Pueblo
Las Animas
Scott City
Elyria
Hudson
Cunningham
Dodge City
Wichita
Paola
Moscow
Centralia
JEFFERSON CITY
SPRINGFIELD
Noble
Salem
Centralia
Fairfield
Valmeyer
Louisville
FRANKFORT
Compton
Lebanon
Owensboro
Somerset
Corbin
Bowling Green
Scottsville
Gate City
Bristol
Danville
Winston-Salem
Liberal
Buffalo
Enid
Sheldon
Steelville
Lebanon
Monett
Anderson
Racine
Independance
Coffeyville
Burbank
Tulsa
Guthrie
Hickman
Clarksville
NASHVILLE
Knoxville
Asheville
Charlotte
Piggott
Fayetteville
Moore
Borger
Burnett
Lefors
Amarillo
Magnolia
Muskogee
Great Lakes
OKLAHOMA CITY
Henryetta
Ada
Chambers
Stuart
Marlow
Kirkland
Alamreed
Sinclair
Columbia
Jackson
Chattanooga
Memphis
Carlinth
Newport
Friar Point
LITTLE ROCK
Hot Springs
Truscott
Electra
Armstrong
Empire
Gainesville
Talco
Texarkana
Louann
El Dorado
Arkansas City
Greenville
Greenwood
West Point
Rome
ATLANTA
Gladsden
Birmingham
Tuscaloosa
Milledgeville
Augusta
Charleston
Savannah
Columbus
Selma
MONTGOMERY
Troy
Albany
Macon
Grand Lake
Rodessa
Saltillo
Dallas
Moran
Van
Corsicana
Vicksburg
JACKSON
Natches
Bull Bayou
Flora
Alexandria
McComb
Hattiesburg
Benifay
TALLAHASSEE
Jacksonville
Gainesville
Tampa
Arcadia
Mobile
Pensacola
Biloxi
Bay St Louis
New Orleans
Destrehan
La Fitte
Pilottown
Bunkie
Lake Charles
Hazelwood
Roanoke
BATON ROUGE
New Iberia
Houston
Sabine Pass
Texas City
Galveston
W Columbia
Bay City
Pearsall
Wink
Pecos
McCamey
Kermer
Iraan
Eldorado
Sonora
Hearne
AUSTIN
Del Rio
San Antonio
Lytle
Sullivan
Tilden
Laredo
Mirando
Charco Redonde
Corpus Christi
Valley
Pt Isabel
Brownsville
Hobbs
Monument
Midland
Comyn
Pandell
Crane
Arthur
Beaumont
Port Arthur
Orange
Lake Charles
Sunray
Shamrock
Amarillo
Texas-NM
Phillips
Shell
Humble
Magnolia
Gulf
Sinclair
Texas
Stanolind
Continental
Cimarron Valley
Great Lakes
Texas-Emp
Ajax
Pure
Standolind
Ohio
Illinois
Buckeye
Indiana
Tex-Ener
Soc-Vac
Conti
Cont'l
Empire
Ohio
Stanolind
Sinclair
Texas
Gulf
Shell
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Indiana
Tex-Ener
Soc-Vac
Conti
Cont'l
Empire
Ohio
Stanolind
Sinclair
Texas
Gulf
Shell
Magnolia
Humble
Atlantic

MAJOR PIPE LINE SYSTEMS

CRUDE OIL

Company—	Miles of Trunk Lines
Ajax Pipe Line Corporation	796
American Liberty Pipe Line Company	190
Arkana Transit Corporation	32
Arkansas Fuel Oil Company	182
Arkansas Pipeline Corporation	91
Atlantic Pipe Line Company	966
Atlas Pipeline Corporation	151
Barnsdall Pipe Line Company	75
Barnsdall Refining Corporation	90
Bell General Pipe Line Company	100
Bell General Transit Company	45
Buckeye Pipe Line Company (The)	1,640
California Company (The)	68
California Pipe Line Company	20
Central States Pipe Line Company	156
Continental Pipe Line Company	1,127
Cosden Pipe Line Company	1,178
Deep Rock Oil Corporation	215
Derby Oil Company (The)	121
Empire Pipeline Company	250
Eureka Pipe Line Company (The)	254
General Petroleum Corporation of California	802
General Pipe Line Company of California	600
Gulf Refining Company	5,772
Humble Pipe Line Company	7,218
Illinois Pipe Line Company	4,776
Indiana Pipe Line Company	650
International Pipe Line Company	28
Kaw Pipe Line Company	485
Leonard Pipe Line Company	125
Lion Oil Refining Company	60
Magnolia Pipe Line Company	1,996
Michigan-Toledo Pipe Line Company	106
National Transit Company	3,450
New Mexico Pipe Line Company	69
New York Transit Company	126
Northern Pipe Line Company	624
Oklahoma Pipe Line Company	1,491
Pan American Pipe Line Company	159
Panola Pipe Line Company	100
Pasotex Pipe Line Company	195
Pure Oil Pipe Line Company (Pennsylvania)	57
Pure Transportation Company	478
Shell Oil Company, Inc.	645
Shell Pipe Line Corporation	3,900
Simrall Corporation	175
Sinclair Pipe Line Company	6,380
Skelly Oil Company	396
Socony-Vacuum Oil Company, Inc.	360
Sohio Pipe Line Company	2,000
South West Pennsylvania Pipe Lines	438
Southern Pipe Line Company	269
Standard Oil Company of California	207
Standard Oil Company of Louisiana, Inc.	1,481
Standish Pipe Line Company	1,284
Stanolind Pipe Line Company	7,303
Sun Oil Line Company	98
Sun Pipe Line, Inc.	90
Texas-Empire Pipe Line Company (The)	1,299
Texas-Empire Pipe Line Company of Texas (The)	214
Texas-New Mexico Pipe Line Company	1,131
Texas Pipe Line Company (The)	4,399
Texas Pipe Line Company of Oklahoma (The)	1,283
Thurber Pipe Line Company	108
Tidal Pipe Line Company	615
Tide-Water Pipe Company, Ltd. (The)	1,244
Tide Water Associated Oil Company (Associated Division)	825
Toronto Pipe Line Company	26
Transit & Storage Company	150
Union Oil Company of California	493
United Oil Pipe Line Company	68
Utah Oil and Refining Company	438
Valley Pipe Line Company	72
Vickers Petroleum Company	65
Wabash Pipe Line Company	47
Yount-Lee Pipe Line Company	300

GASOLINE

Company—	Miles of Trunk Lines
Arkansas Fuel Oil Company (leased)	190
Bell Oil and Gas Company	17
Buffalo Pipe Line Company	161
Cimarron Valley Pipe Line Company	230
Derby Oil Company (The)	56
Detroit Southern Pipe Line Company	85
Great Lakes Pipe Line Company	2,134
Illama Pipe Line Company	320
Keystone Pipe Line Company	856
Lion Oil Refining Company	14
Phillips Pipe Line Company	799
Shell Pipe Line Company	280
Socony-Vacuum Oil Company (White Eagle Division)	175
Socony-Vacuum Oil Company (Eastern Division)	104
Standard Oil Company (Ohio)	70
Sun Pipe Line Company (Susquehana Pipe Line Co., Sun Pipe Line, Inc., and Sun Oil Line Company)	732
Tuscarora Oil Company, Ltd.	538
U. S. Pipe Line Company	58
Standard Oil Company (Indiana)	160

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